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A COMPARISON OF BASAL METABOLIC RATES OBTAINED BY GASOMETRIC ANALYSIS AND FORMULÆ.¹

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THE development of accurate methods of determining the respiratory exchange has resulted in the basal metabolic rate being used more extensively as an index of the variation in thyroid activity. Moreover, one of the outstanding uses of this test has been the separation of cases of nervous excitability from hyperthyroidism. Its determination, however, necessitates certain requirements

being fulfilled, the presence of an assistant trained in this work, and the use of apparatus which is usually only to be found in the laboratories of large hospitals. Consequently it would be an advantage if this complicated and time-consuming method could be supplemented or replaced by simpler calculations. Efforts have been made to overcome this difficulty by estimating the basal metabolism from formulae in which the variations in pulse rate and pulse pressure are utilized. Since the publication of Read's formula⁽¹⁾ in 1922 several others have been suggested and used. The object of this paper is to compare the results of basal metabolism obtained by gasometric analysis and formulæ.

It has long been recognized that the pulse rate, blood pressure and respiratory rate showed definite deviations from the normal when the basal metabolic rate was markedly altered. These variations could be roughly expressed quantitatively in terms of blood pressure and pulse rate changes

¹This work was carried out in 1934 during the tenure of the Alwyn Stewart and Alcock Research Scholarship of the University of Melbourne.

since the circulatory system, for example in myxœdema and hyperthyroidism, would show alterations in the rate of oxygen transport to the tissues. J. Marion Read,⁽¹⁾ during a period of eighteen months, investigated a series of three hundred patients to see whether a fairly exact and constant relationship existed between the pulse rate and pulse pressure on the one hand and the basal metabolic rate on the other hand. The pulse rate and pulse pressure readings were made in the resting interval between two ten-minute breathing tests. Apart from the elimination of all patients who showed changes in pulse rate and pulse pressure due to an obvious pathological lesion in the cardio-vascular system, namely, a blood pressure above 160 millimetres of mercury, and cardiac irregularities, as auricular fibrillation and heart block, there was no selection of cases. Tables were made correlating the gasometric basal metabolic rate with the highest and lowest pulse rates and pulse pressures. Usually with an elevated metabolic rate there was an increase in both pulse rate and pulse pressure; however, sometimes one showed a considerable increase with little or no change in the other. The association of a rapid pulse and an increased pulse pressure is characteristic of thyrotoxicosis. Usually an increased pulse rate is accompanied by a small pulse pressure. In hypothyroidism there is usually an elevation of the diastolic pressure, a small pulse pressure and a slow pulse rate. These findings suggested a relationship between pulse pressure and metabolic rate. Means and Aub⁽²⁾ found the pulse rate and basal metabolic rate to be closely associated in 60% of cases, and in the remaining cases a certain amount of parallelism. Moreover, Sturgis and Tompkins,⁽³⁾ in investigating the pulse rate in a series of 154 cases, noted that a persistent heart rate of ninety beats or more per minute indicated an increased metabolism, provided that obvious causes for tachycardia could be excluded. Sandiford⁽⁴⁾ found that the basal metabolism curve, on an average, ran parallel to the pulse rate curve, but observed that the former gave a far more accurate index of the degree of hyperthyroidism than the pulse rate, since the latter showed more individual extraneous variations. On the other hand, Harris and Benedict⁽⁵⁾ point out that females have a higher basal pulse rate than males, and at the same time a lower basal metabolic rate, and that these findings indicate that the average pulse rate may have little, if any, connexion with the average heat production in a group of individuals. However, Read⁽¹⁾ in his investigations observed that a variation in one of the factors was often accompanied by an alteration of the other in the opposite direction, and he therefore attempted to combine the pulse rate and pulse pressure in such a way as to smooth out the discrepancies. The coefficients of correlation between pulse rate and basal metabolism and between pulse pressure and basal metabolism were found to be 0.69 and 0.62 respectively, if one took unity as representing perfect correlation. By

applying statistical methods Read obtained the following formula:

$$\text{Basal metabolic rate} = 0.683 (\text{pulse rate} + 0.9 \text{ pulse pressure}) - 71.5. \quad (\text{Read's original formula.})$$

With the above formula it has been assumed that the relationship of pulse rate and pulse pressure to the basal metabolic rate is a straight line. Great accuracy of prediction is difficult to attain because of the great variation of pulse pressure, and particularly of pulse rate, which may occur even in healthy people.

In 1924, Read,⁽⁶⁾ after a careful investigation of six hundred patients as above, concluded that the following formula gave much better results than his original formula:

$$\text{Basal metabolic rate} = 0.75 (\text{pulse rate} + 0.74 \text{ pulse pressure}) - 72. \quad (\text{Modified Read's formula.})$$

Somewhat later Gale and Gale,⁽⁷⁾ after an analysis of 1,006 cases, reported a new formula which gave, in their opinion, the best results in approximating to the gasometric basal metabolism determinations.

$$\text{Basal metabolic rate} = \text{pulse rate} + \text{pulse pressure} - 111. \quad (\text{Gale and Gale's formula.})$$

Further alterations to these formulæ have been made by Jenkins,⁽⁸⁾ who obtained his coefficient of correlation from 4,120 routine basal metabolic determinations. Jenkins found that the pulse rate coefficient was lower than that obtained by Read. Consequently Jenkins's formula, as calculated both for males and females separately, gives lower results than the modified Read formula.

$$\text{Basal metabolic rate} = 0.534 \text{ pulse rate} + 0.436 \text{ pulse pressure} - 59.94. \quad (\text{Jenkins's formula for men.})$$

$$\text{Basal metabolic rate} = 0.497 \text{ pulse rate} + 0.368 \text{ pulse pressure} - 57.42. \quad (\text{Jenkins's formula for women.})$$

The above formula takes advantage of the fact that the pulse rate of men and women differs. Thus Sutcliffe and Holt⁽⁹⁾ noted that the basal pulse rate in males varied from fifty to seventy, and in females from sixty to eighty beats per minute. Consequently there is no reason why both sexes should have the same formula.

The recent interest reawakened in the estimation of basal metabolism by formulæ resulted in Read and Barnett⁽¹⁰⁾ reinvestigating the whole subject in an attempt to increase the reliability of the formula method so that it might prove suitable for clinical use. These two workers studied 416 females and 321 males and found that heat production was lower in the female than in the male, and from their observations derived the following formulæ.

For males:

$$\begin{aligned} \text{Calories per square metre per hour} = \\ \frac{\text{Pulse rate} \times \text{pulse pressure}}{200} + 27 \end{aligned}$$

(Read and Barnett's formula for males.)

For females:

$$\begin{aligned} \text{Calories per square metre per hour} = \\ \frac{3 \times \text{pulse rate} \times \text{pulse pressure}}{700} + 24 \end{aligned}$$

(Read and Barnett's formula for females.)

The basal metabolic rate is then calculated in the usual way from suitable tables, which take age, size and sex into account. Even Read and Barnett,⁽¹⁰⁾ at the conclusion of their article, felt that the accuracy of their formula might be increased by altering the constants, possibly after recalculation on a larger series.

In judging the value of any formula for calculation of the basal metabolic rate it should be recognized that the standard with which we compare the estimated rate is not always determined with perfect accuracy, apart from numerous other factors which come into play. In all these patients the respiratory quotient was calculated, and if it is not estimated for each patient a certain error will result. Poulton,⁽¹¹⁾ in a recent paper, seriously questioned whether the respiratory quotient should be regarded as equal to 1.0 when carbohydrate alone is burnt in the body, 0.707 when fat is being burnt, or intermediate figures when corresponding proportions of carbohydrate and fat are oxidized.

The gasometric basal metabolic rates in these patients were determined by indirect calorimetry. The breathing test lasted usually for eight minutes; the expired air was collected in a Douglas bag and the amount measured by a meter. A sample was then analysed by the gas analysis apparatus of Haldane, and thence the basal metabolic rate was calculated from the du Bois standard tables. In carrying out these estimations the following basal conditions were fulfilled:

1. Post-absorptive condition. All patients were instructed to have nothing to eat for ten hours prior to the estimation. In addition, all the tests were carried out early in the morning.

2. Preliminary rest period with full muscular and mental repose. Some of these patients were in-patients and were not allowed to leave their beds during the night before the test. The majority were out-patients and were rested for thirty to forty minutes before the estimation. Benedict and Crofts⁽¹²⁾ showed that the results obtained in ambulatory patients were no different and quite satisfactory, provided adequate mental and physical rest was obtained. However, Lublin⁽¹³⁾ found that some of these patients might still have a raised metabolism, and pointed out that an elevation of oxygen intake in such metabolic rates could not with certainty be regarded as of thyreogenic origin. In addition, strenuous exercise or excess fatigue during the previous twenty-four hours should be avoided, as this would also give altered readings. Mental relaxation is often difficult to obtain, especially in nervous patients, and this difficulty is frequently increased by the introduction of the mouth-piece, the application of the nose-clip, and the breathing into the bag. Consequently a sympathetic and kindly attendant is essential in this type of work. Moreover, the test may need to be repeated several times before a satisfactory and reliable result can be obtained.

3. Normal temperature. An elevation of temperature by 1° C. will increase the basal metabolic rate

by 10%. Consequently the temperature should always be taken to make sure that no febrile condition is present. It would also be helpful to count the pulse frequency and wait till it had assumed a basal level.

The pulse rate and blood pressure readings were also taken under the above basal conditions, the majority immediately preceding the gasometric determinations and the minority after the test and when the pulse rate had become steady again. The pulse rate readings were taken over a period of several minutes, till they showed little or no variation in frequency per minute. Unless this is carefully done, high readings will be obtained for the basal pulse rate. In this series the blood pressure was estimated by a Baumanometer; the height of the systolic pressure was taken as the first sound which appeared when the tourniquet was released, whilst the diastolic pressure was obtained at that point where the sounds were accentuated before disappearing, that is, at the end of the third phase. If the fourth phase were to be taken as the reading for the diastolic pressure, a pulse pressure often higher by five to seven millimetres of mercury would be obtained. Such an error would also affect the final formula result.

In this paper a comparison of the basal metabolic rate in 250 patients, as obtained by gasometric analysis and three formulæ, namely Read's, modified Read's, and Gales' formulæ, will be made. Miss Splatt, Biochemist to the Royal Melbourne Hospital, carried out all the gasometric analyses, whilst I was responsible for the estimations by the formula. In addition, the work was carried out independently, and this enhanced the value of comparison of the two methods of estimation. The patients examined in this series were all referred to the biochemical laboratory for gas analysis, and no special selection was made. Only those patients suffering from gross cardio-vascular and renal disease, those with a blood pressure above 160 millimetres of mercury, and those with cardiac irregularities, such as auricular fibrillation and heart block, were excluded in this comparison.

The cases in this series have been classified into thyreoid and non-thyreoid diseases (Table I). The

TABLE I.

Classification of Cases used in the Comparison of Basal Metabolic Rates obtained by Gasometric Analysis and Formula.

Condition.	Total.
(A) Thyreoid Disease:	
(i) Non-toxic goitre:	
(a) Diffuse 66	103
(b) Nodular 37	
(ii) Toxic goitre:	
(a) Diffuse 58	80
(b) Nodular 22	
(iii) Myxodema 5	
(iv) Post-thyreoid operations for follow-up 19	
(B) Non-thyreoid Disease:	
Obesity, 7; asthma, 3; nervousness, 15; anxiety neurosis, 2; visceroptosis, 1; anemias, 2; tumour of neck, 1; chronic nephritis, 1; Simmond's disease, 1; anorexia nervosa, 1; undiagnosed, 9	43

separation of thyroid disease into its components is difficult, and many classifications have been suggested. However, the one used by Fairley⁽¹⁴⁾ in a recent paper appeared to be the simplest and most practical; it has therefore been used in this publication.

As will be seen from Table I, thyroid disease accounted for 207 (80%) of the series; of this total, 103 (49.7%) were non-toxic and 80 (38.6%) were toxic thyroids. Only five patients with myxœdema were observed, whilst the remaining cases in the thyroid group were patients who had been operated on for hyperthyroidism and who were still showing signs of thyroid activity, which was being treated by deep X ray therapy. The non-thyroid group consisted of a miscellaneous series of diseases, the majority of which gave some symptoms or signs suggestive of hyperthyroidism.

The results of basal metabolic rates obtained by indirect calorimetry and formulæ are compared in Table II and are expressed in percentage error of the gasometric result, which is accepted as being correct for the purpose of this comparison.

TABLE II.

Percentage Error Obtained by Formulæ in Comparison with Gasometric Basal Metabolic Rate for all Cases.

Error.	Read's Formula.	Modified Read's Formula.	Gales' Formula.
Less than 5%	55 (22.0%)	53 (21.2%)	54 (21.6%)
Less than 10%	102 (40.8%)	93 (37.2%)	87 (34.8%)
Less than 15%	129 (51.6%)	124 (49.6%)	127 (50.8%)
Less than 20%	173 (69.2%)	163 (65.2%)	163 (65.2%)
Greater than 20% ..	77 (30.8%)	87 (34.8%)	87 (34.8%)

This revealed the fact (Table II) that only approximately one-fifth of the results as estimated by formulæ have an error of less than 5%, one-half of the cases an error less than 15%, whilst more than 30% of the cases deviate by more than 20% from the gasometric results. These high variations are not encouraging and will be compared with results obtained by other investigators. Read,⁽¹⁾ in his first paper in 1922, using his original formula, noted an error of less than 10% in 60% of his cases and an error of less than 20% in 91% of his estimations. At that time Read made the statement that greater accuracy of prediction of the basal metabolic rate by formulæ would be difficult to attain, because of the individual variations of pulse pressure and, particularly, of pulse rate which occurred even in health. With his modified formula Read⁽⁶⁾ in 1924 reported that slightly over one-half of his patients had an error of less than 10%, a finding not quite so satisfactory as with his original formula. Gale and Gale⁽⁷⁾ with their formula found that 27.5% of cases had an error of less than 5%, 45.6% less than 10%, 57.4% less than 15%, and 73.7% less than 20%. Moreover, Gale and Gale, with the modified Read's formula, observed that 15.3%, 25.9%, 36.1% and 43.6% of patients had errors of 5%, 10%, 15% and 20% respectively; and they therefore concluded that their new formula was far more reliable than the modified Read.

TABLE III.

Error of Formula (Modified Read) Compared with Gasometric Basal Metabolic Rate as Obtained by Different Investigators.

Investigator.	Cases Examined.	Error.			
		Less than 5%.	Less than 10%.	Less than 15%.	Less than 20%.
Read ⁽⁴⁾	600		50.0% (Appr.)		
Gale and Gale ⁽⁷⁾	1,008	15.3%	25.9%	36.1%	43.6%
Umber ⁽¹⁵⁾	100	35.0%	64.0%	80.0%	91.0%
Bertheau ⁽¹⁶⁾	50	42.0%	72.0%	88.0%	96.0%
Hartleben ⁽¹⁷⁾	180		50.0%		73.0%
Neumann ⁽¹⁸⁾	80	28.0%	45.0%	66.0%	78.0%
Frank	250	21.2%	37.2%	49.6%	65.2%

In this paper (Table II) it will be seen that the errors in both Gales' and modified Read's formula are very similar, so that no advantage is derived in using the one in preference to the other.

Apart from the originators of the formulæ, other investigators, as Umber⁽¹⁵⁾ and Bertheau⁽¹⁶⁾ have obtained very close results. Umber,⁽¹⁵⁾ in his analysis of 100 cases (52 of which were toxic goitres), found nine (9%) with an error greater than 20%. Eight of these patients had exophthalmic goitre. In addition he also noted that where the gasometric basal metabolic rate exceeded +45%, the formula tended to lag behind, whilst with a low rate, below $\pm 0\%$, it tended to be higher. This observation was also made by me. In two cases in which the specific dynamic energy was investigated, Umber reported that the results of basal metabolism as obtained respectively by formulæ and gasometric analysis corresponded very closely.

However, such good results have not been obtained by other investigators (Table III). Both Hartleben⁽¹⁷⁾ and Neumann⁽¹⁸⁾ recorded a higher percentage of error than Umber and Bertheau and slightly better results than those obtained in this paper. Hartleben⁽¹⁷⁾ also found that Jenkins's formula gave more inaccurate results than the modified Read formula. From the above results it will be clearly seen that estimation of basal metabolism by formulæ gives too high an error to justify its use.

The individual types of thyroid disease were next analysed to ascertain which group corresponded most closely to the formula, and also to find out which type of disorder gave the greatest percentage of error. The results are shown in Table IV.

It will be seen that of all the thyroid enlargements the non-toxic nodular goitres approximated most closely to the gasometric result, for over 60% of the cases had an error less than 15%. The non-toxic diffuse, toxic diffuse and toxic nodular thyroid enlargements had a somewhat similar margin of inaccuracy—under 15% of error (Table IV).

Moreover, the greatest deviation from the gasometric basal metabolic rate occurred in toxic nodular goitre. Umber,⁽¹⁵⁾ in an analysis of 52 cases of toxic goitre, found eight (15.4%) with an error greater than 20%, whilst only one other case with a similar high error occurred amongst the

TABLE IV.
Percentage Error in Estimation of Basal Metabolism by Formula as Compared with Gasometric Analysis for Thyroid Disease in 207 Cases.

Observation.		Type.					
		Non-toxic Diffuse. (66 cases.)	Non-toxic Nodular. (37 cases.)	Toxic Diffuse. (58 cases.)	Toxic Nodular. (22 cases.)	Myxœdema. (5 cases.)	Post-operative Goitres. (19 cases.)
Error less than 5%	R	15 (22.7%)	10 (27.0%)	12 (20.7%)	5 (22.7%)	1 (20.0%)	5 (26.3%)
	MR	12 (18.2%)	8 (21.6%)	16 (27.6%)	6 (27.2%)	0	4 (21.0%)
	G	15 (22.7%)	11 (29.7%)	10 (17.2%)	4 (18.2%)	1 (20.0%)	5 (26.3%)
Error less than 10%	R	27 (40.9%)	19 (51.3%)	21 (36.2%)	10 (45.4%)	1 (20.0%)	10 (52.6%)
	MR	26 (39.4%)	15 (40.5%)	22 (38.0%)	8 (36.3%)	1 (20.0%)	8 (42.1%)
	G	23 (34.8%)	18 (48.6%)	22 (38.0%)	5 (22.7%)	2 (40.0%)	5 (26.3%)
Error less than 15%	R	37 (56.0%)	23 (62.1%)	28 (48.2%)	12 (54.5%)	2 (40.0%)	12 (63.1%)
	MR	34 (51.5%)	24 (64.8%)	29 (50.0%)	11 (50.0%)	1 (20.0%)	10 (52.6%)
	G	33 (50.0%)	24 (64.8%)	31 (53.4%)	8 (36.3%)	3 (60.0%)	10 (52.6%)
Error less than 20%	R	46 (69.7%)	30 (81.0%)	42 (72.4%)	13 (59.0%)	4 (80.0%)	12 (63.1%)
	MR	45 (68.2%)	29 (78.3%)	39 (67.2%)	14 (63.6%)	4 (80.0%)	12 (63.1%)
	G	46 (69.7%)	27 (72.9%)	38 (65.5%)	12 (54.5%)	4 (80.0%)	11 (58.0%)
Error greater than 30%	R	5 (7.5%)	3 (8.1%)	8 (13.8%)	5 (22.7%)	0	4 (21.0%)
	MR	8 (12.1%)	5 (13.5%)	7 (12.0%)	5 (22.7%)	1 (20.0%)	4 (21.0%)
	G	12 (18.1%)	6 (16.2%)	8 (13.8%)	5 (22.7%)	1 (20.0%)	5 (26.3%)

R = Read's formula; MR = Modified Read's formula; G = Gales' formula.

48 non-toxic cases. Hartleben,⁽¹⁷⁾ in a series of 52 patients with thyrotoxicosis, found that 65% of them had an error greater than 10%, and also showed, as others have done, that the higher the gasometric basal metabolic rate, the greater the percentage of error in the formulæ. However, for the diagnosis of a severe thyrotoxicosis a basal metabolism estimation is not absolutely necessary, since the clinical findings are typical and most important; the latter will indicate the degree of thyroid activity. In addition, gasometric basal metabolism does not always run parallel with a severe thyrotoxicosis.

When the results from non-thyroid cases (Table V) were compared with the findings in the thyroid series (Table IV), it was seen that the agreement between the formula and gasometric determinations was even less marked. In this series approximately 16% of the patients had an error less than 5%, and 35% an error less than 15%, as compared with 27% and 62% respectively in the non-toxic nodular goitre groups. This increased discrepancy was due to the fact that the group of cases in the non-thyroid group was a miscellaneous one and included many patients with nervous features, such as excitability, loss of weight, tremor and sweating. The last mentioned symptoms often produced a syndrome which was mistaken for hyperthyroidism, especially when associated, as it often was, with slight colloid thyroid enlargement. In these patients the gasometric basal metabolic rate was nearly always normal, sometimes subnormal,

and this clinical state responded to medical treatment. With formulæ this type of case usually gave a reading above normal and, therefore, if the result were to be relied on, it might be mistaken for hyperthyroidism and treated surgically. These cases of nervous excitability partly explained why the formula results in non-thyroid disease (Table V) showed a greater deviation from the normal than in thyroid disease (Table IV). Consequently, especially in this type of case, where a correct estimation of the basal metabolic rate was so essential and helpful, the formula method could not be recommended.

In comparing the results obtained by the three different formulæ (Tables II, IV and V), it was found that the two Read's formulæ were a little more accurate than Gales' formula. In addition, the original Read's formula appeared to be slightly more exact than his modified method, although the difference was not very pronounced.

The points of closest correspondence and greatest divergence between the gasometric and formulæ determinations of basal metabolic rate were next elucidated. On carefully analysing Table VI, in which the gasometric metabolic rates are divided into tens (for purposes of comparison) the errors in the formula method are shown and the variations and limitations of the formulæ can be seen, especially on examining the columns containing the 20% errors. In myxœdema and hypothyroidism with a low basal metabolism the agreement was poor, for only about 44% of cases agreed within 20% of the

TABLE V.
Percentage Error in Estimation of Basal Metabolism by Formula as Compared with Gasometric Analysis for Non-thyroid Disease.

Formula.	Error in 43 Cases.				
	Less than 5%.	Less than 10%.	Less than 15%.	Less than 20%.	Greater than 30%.
Read's	7 (16.3%)	14 (32.5%)	15 (35.0%)	26 (60.4%)	8 (18.6%)
Modified Read's	7 (16.3%)	13 (30.2%)	15 (35.0%)	20 (46.5%)	7 (16.3%)
Gales'	8 (18.6%)	12 (28.0%)	18 (41.8%)	25 (58.1%)	10 (23.2%)

gasometric result. This point was well illustrated in a myxœdematous patient, aged forty-six years, whose basal metabolic rate as determined by gas analysis was -22 and by the formulæ of Read, modified Read and Gale +8, +10 and +11 respectively, an error varying from 30% to 33%. Clinically this patient behaved very well, for her pulse rate settled down to 76 beats per minute and her blood pressure to 126 millimetres of mercury systolic and 80 diastolic. The discrepancy in these cases is often due to slight increase of the pulse rate from excitement or to an elevation of the pulse pressure from factors outside the thyroid condition.

The closest approximation between the two methods of estimation of basal metabolic rate occurred between the values of -10 and +40 (Table VI), the best agreement occurring between the values of +11 and +20, and at this level 95.4% of patients had an error less than 20%. Bertheau⁽¹⁶⁾ in his analysis found that the closer the metabolic rate approached normal values, the better the agreement between the two methods, and he concluded that the greatest value of the formula was for these border-line cases. Neumann,⁽¹⁸⁾ however, found that whilst the gas analysis gave a clear picture of metabolism, the result as obtained by Read's formula was doubtful and even confusing. Even if the gasometric result was below ± 0 , Read's might not be under this value, and at times the error might be considerable, so that no sound conclusions could be drawn from the formula with values between +10 and +30. On the other hand, in this series, the results between these two heights (+10 and +30) were the most satisfactory and agreed with the findings of Umber⁽¹⁵⁾ and Bertheau.⁽¹⁶⁾ With the low values of basal metabolism, a variation of ten between the gasometric and formula results, as Olmes⁽¹⁹⁾ has pointed out, could have a different significance as, for example, values between -5 and +5 and between +14 and +24. This error might make all the difference between a diagnosis of hypothyroidism and a normal value or a mild

hyperthyroidism. For the border-line cases, namely, the determination of whether there was under-activity or over-activity of the thyroid gland, an accurate result would be most essential. Consequently, even in this type of case, the exactness of the formula method cannot be relied upon.

With an elevation of the basal metabolic rate the formula became more inaccurate, so much so that in only 17.3% of the cases, according to Read's formula with a gasometric rate above +51%, was there an error of less than 20% (Table VI). With these cases, Gales' formula, as has also been noted by other observers, gave better and more accurate results. Even this is not of very great significance, for in the very active thyrotoxic cases the gasometric metabolic rate does not always run parallel with the severity of the clinical symptoms and consequently is not an actual measure of the over-activity of the thyroid gland. This same fact applies to formulæ, for even if they show pathological values, they can give us no accurate measure of the intensity of the metabolic disturbance. Table VII illustrated very clearly how the formula estimation tended to lag behind the gasometric result in cases of marked hyperthyroidism. The four cases of hyperthyroidism were chosen at random, and in Albert W. there is a difference of +75 between Read's formula and the gasometric analysis result. Clinically, these patients did not appear to have such high metabolic rates, but at the present time gasometric analysis is the most reliable method of measuring the thyroid gland activity. Three of the cases illustrated the inaccuracy of formula determination, for even with marked hyperthyroidism the pulse rate was relatively slow. These results also showed that the pulse rate did not necessarily run parallel with the basal metabolic rate and that before a gasometric basal metabolic result is accepted as exact, more than one determination should be done.

Till now, the variations between the formulæ and gas analysis determinations have been commented

TABLE VI.

Site of Error of Basal Metabolic Rate when Calculated by Formulae and Compared with the Gasometric Result.

Observation.	Gasometric Basal Metabolic Rate Values.							
	-30 to -11. (36 cases.)	-10 to ± 0 . (67 cases.)	+1 to +10. (84 cases.)	+11 to +20. (22 cases.)	+21 to +30. (26 cases.)	+31 to +40. (26 cases.)	+41 to +50. (16 cases.)	Over +51%. (23 cases.)
Error less than 5%—								
R	0	18 (26.8%)	11 (32.3%)	7 (31.8%)	8 (30.7%)	8 (30.7%)	3 (18.7%)	0
MR	0	14 (20.9%)	8 (23.5%)	8 (36.3%)	10 (38.4%)	9 (34.6%)	4 (25.0%)	1 (4.3%)
G	4 (11.1%)	22 (32.8%)	9 (26.4%)	3 (13.6%)	5 (19.2%)	7 (26.9%)	2 (12.5%)	2 (8.7%)
Error less than 10%—								
R	3 (8.3%)	31 (46.2%)	19 (55.9%)	13 (59.1%)	16 (61.5%)	14 (53.8%)	4 (25.0%)	1 (4.3%)
MR	0	27 (40.3%)	18 (52.9%)	14 (63.6%)	14 (53.8%)	14 (53.8%)	5 (31.2%)	1 (4.3%)
G	6 (16.6%)	28 (41.8%)	12 (35.3%)	10 (45.4%)	11 (42.3%)	12 (46.1%)	3 (18.7%)	4 (17.3%)
Error less than 15%—								
R	6 (16.6%)	40 (59.7%)	23 (67.0%)	18 (81.8%)	18 (69.2%)	17 (65.4%)	5 (31.2%)	2 (8.7%)
MR	4 (11.1%)	35 (52.2%)	22 (64.7%)	17 (77.3%)	20 (76.9%)	17 (65.4%)	6 (37.5%)	2 (8.7%)
G	11 (30.5%)	35 (52.2%)	20 (58.8%)	15 (68.2%)	19 (73.0%)	15 (57.7%)	5 (31.2%)	6 (26.0%)
Error less than 20%—								
R	16 (44.4%)	51 (76.1%)	28 (82.3%)	21 (95.4%)	24 (92.3%)	23 (88.4%)	6 (37.5%)	4 (17.3%)
MR	15 (41.6%)	47 (70.1%)	24 (70.6%)	20 (90.9%)	24 (92.3%)	22 (84.6%)	6 (37.5%)	5 (21.7%)
G	19 (52.8%)	44 (65.6%)	23 (67.0%)	16 (72.7%)	23 (88.4%)	19 (73.0%)	9 (56.2%)	8 (34.8%)
Error greater than 30%—								
R	10 (27.8%)	4 (5.9%)	1 (2.9%)	0	0	0	4 (25.0%)	14 (60.8%)
MR	12 (33.3%)	7 (10.4%)	1 (2.9%)	1 (4.5%)	0	0	2 (12.5%)	14 (60.8%)
G	11 (30.5%)	12 (17.9%)	6 (17.6%)	3 (13.6%)	2 (7.7%)	2 (7.7%)	1 (6.2%)	10 (43.5%)

R = Read's formula; MR = Modified Read's formula; G = Gales' formula.

TABLE VII.
Comparison of the Results of Estimation of Basal Metabolic Rates by Formulae and Gasometric Analysis in Hyperthyroidism.

Name.	Age.	Gasometric Analysis.	Read's Formula.	Modified Read's Formula.	Gales' Formula.	Diagnosis and Comment.
William C.	41	+100	+48	+51	+71	Very active diffuse toxic goitre. Pulse rate 112.
George C.	?	+70	+18	+20	+25	Very active diffuse toxic goitre, but clinically did not appear to be +70. Slow pulse rate of 84 beats per minute.
Albert W.	45	+100	+25	+28	+35	Diffuse toxic goitre. Post-operative recurrence. Clinically did not appear to be +100. Pulse rate 100 beats per minute.
Violet E.	43	+61	+18	+19	+27	Very active toxic adenoma. Pulse rate only 72 beats per minute.

on, but on analysis of Table VIII it will be seen that in some cases a close correspondence between the two methods did occur. If this approximation were as close for a higher percentage of cases—in only 22% of all cases was there an error less than 5%—the formula would prove very helpful, easy to carry out and save much laboratory work.

formulae and gas methods for basal metabolic rate estimations corresponded fairly closely in the subsequent progress of the case. In Cases V and VI (Table IX) it will be seen that the metabolism values as obtained on two occasions corresponded closely. However, in Cases II and III, both toxic goitres, the formula value for the basal metabolic

TABLE VIII.
Illustration of the Close Correspondence of Basal Metabolism of Formulae and Gasometric Analysis in Some Cases.

Name.	Age.	Gasometric Analysis.	Read's Formula.	Modified Read's Formula.	Gales' Formula.	Remarks.
Elizabeth S.	32	+28	+21	+23	+31	Toxic adenoma of thyroid.
Elizabeth W.	44	+30	+32	+35	+45	Toxic diffuse goitre.
Mona K.	30	+80	+65	+68	+97	Toxic diffuse goitre.
Monica D.	16	+50	+51	+54	+75	Toxic diffuse goitre.
Pearl S.	38	±0	-1	±0	-3	Non-toxic diffuse goitre.
Constance C.	25	-7	-7	-6	-13	Non-toxic adenoma.
May F.	46	+4	+5	+6	+5	Non-toxic diffuse goitre.

It was originally suggested by Read that, after having determined the basal metabolism both by formulae and gas analysis, the subsequent progress of the patient during treatment could be followed by the use of the formulae determinations. Hunt⁽²⁰⁾ in a series of investigations found that iodine treatment appeared to improve the circulatory system, as shown by Read's formula, more definitely and permanently than it improved the basal metabolic rate. The latter did not appear to be reduced for very long by the comparatively small doses of iodine given. In addition, Hunt⁽²⁰⁾ found that the

rate dropped more rapidly than the gasometric estimation, results which have been obtained by other investigators. Bertheau⁽¹⁶⁾ stated that if two gasometric determinations of the basal metabolism agreed closely with the formula, the latter method could be used to follow up the result of treatment. On the other hand, Böger and Voit⁽²¹⁾ found that even in controls the formula was not helpful and did not give the exact information which was obtained from a gasometric analysis. In an analysis of 256 cases in which metabolic rates were calculated by formulae and gasometric analyses, Cameron,

TABLE IX.
Comparison of Basal Metabolic Rates obtained by Gas Analysis and Formulae during Treatment.

Name.	Age.	Date.	Gasometric Basal Metabolic Rate.	Read Rate.	Modified Read Rate.	Gale Rate.	Pulse Rate.	Blood Pressure in Millimetres of Mercury.	Comments.
I. Mabel B. . .	42	15/11/33	+7	+18	+21	+25	90	126/80	Post-operation toxic diffuse goitre under radium treatment.
		17/1/34	+22	+20	+23	+25	100	120/84	
		4/4/34	+5	+13	+18	+17	88	120/80	
II. Marjorie B. . .	18	10/1/34	+36	+54	+57	+61	102	140/70	Diffuse toxic goitre. Pre-operative iodine treatment.
		17/1/34	+27	+26	+29	+37	96	120/68	
III. Marie E. . .	45	31/1/34	+36	+27	+31	+39	100	144/94	Diffuse toxic goitre. Pre-operative iodine treatment.
		7/2/34	+50	+19	+22	+25	96	100/60	
IV. Brenda F. . .	19	12/2/34	+44	+18	+11	+9	84	118/82	Diffuse toxic goitre, treated with iodine for a long period. On March 23, 1934, definitely worse, in spite of a better gasometric result.
		14/2/34	+20	+38	+42	+55	114	120/68	
		28/2/34	+38	+30	+33	+43	100	114/60	
		23/3/34	+25	+41	+46	+59	120	110/60	
V. Lucy L. . .	31	14/6/34	-1	±0	+4	-3	80	106/78	Non-toxic adenoma.
		20/6/34	-5	-1	±0	-5	66	98/56	
VI. Edna T. . .	18	18/5/34	-19	±0	+1	-3	68	110/70	Non-toxic diffuse goitre.
		7/8/34	-12	+5	+6	+5	70	134/88	

Kitchen and McRae⁽²²⁾ came to the conclusion that formulæ could not be used successfully in checking up the results of progress of treatment.

Conclusions.

In a consideration of the value of formulæ for estimating basal metabolic rates, two main difficulties arise, namely, the determination of the basal pulse rate and pulse pressure. Very many factors apart from cardio-vascular disease can affect the pulse rate, and here excitement and mental disturbances resulting from the strange surroundings should be noted. Moreover, the basal pulse rate of females is usually slightly more rapid than that of males. As pointed out previously, although the pulse rate is usually elevated with an increased basal metabolic rate, this need not necessarily be so. In addition, in toxic goitre patients who have been given pre-operative iodine treatment the pulse rate shows a more marked diminution in rate than the basal metabolism, and consequently formulæ will tend to give lower results than the gasometric analysis. Pulse rate and basal metabolism therefore do not necessarily run parallel.

Although an increased pulse pressure occurs typically in diffuse toxic goitre, it can also occur in other conditions, for example, in excitement and in irritable heart disease. Even in normal people it may show wide variations from the usually accepted values. Moreover, its accurate determination depends on an exact reading of the systolic and diastolic pressures, and consequently any factors which may affect either of these pressures, such as unrecognized early cardio-vascular disease, cardiac volume output, and increased tone of the peripheral arterioles, will influence the result obtained by use of the formula. Consequently any error in pulse rate and pulse pressure must have corresponding effects on the accuracy of formulæ, and, as these two factors vary markedly even in normal people, the resulting inaccuracy may be considerable, and consequently erroneous deductions can be made from the formulæ.

Even an exact estimation of the basal metabolism by gasometric methods is associated with difficulties. The basal conditions for the test, the full cooperation of the patient, the avoidance of the nervous factor, and the assistance of a skilled metabolist are all essential for the success of this estimation. Any of these factors may necessitate the repetition of the test several times in order to obtain a satisfactory result. However, in a second or third test the patient may not cooperate so well as in the first test,⁽²³⁾ and consequently a higher reading may be obtained. In very nervous people, if a gasometric analysis can be done, very frequently a low basal metabolic rate is obtained,⁽²³⁾ in contrast to what one would anticipate. It would be advisable to record the basal pulse rate in all cases and, according to Smith,⁽²⁴⁾ if with a basal metabolic rate of +20 the pulse rate is less than ninety beats per minute, the accuracy of the metabolic study should be doubted. A repetition of the test will often give a lower reading. Moreover, clinical

judgement of the activity of the thyroid gland and gasometric basal metabolic rates do not always correspond, many of the results, according to the latter method, appearing to be too high clinically. The diagnosis of hyperthyroidism or hypothyroidism should never rest on the determination of the basal metabolic rate alone, but must always be made in conjunction with the clinical picture.

The results obtained in this paper by comparing various formulæ with gasometric analysis showed a large percentage of error, so high that it did not justify the use of this method for diagnosis. In this investigation the greatest error occurred in the cases with a low or a high metabolic rate. Such an inaccuracy in border-line determinations between hypothyroidism, hyperthyroidism and normal rates may make a big difference to treatment. With an elevated basal metabolic rate above +30 or +40, even if the formula did not follow the gasometric result closely, the error would not be so serious. That the use of formulæ for the determination of the basal metabolic rate is unsatisfactory has been clearly shown by the results obtained in this paper, and also by the fact that so many variations in this method have been produced within recent years. In addition, the originator of the formula has recently modified his formula for males and females and now calculates the caloric production per hour and thence deduces the basal metabolic rate by means of tables. It thus appears that at the present time a simple method of determining basal metabolism is not possible.

Summary.

1. A comparison of basal metabolic rates obtained by indirect calorimetry (Douglas bag and Haldane gas analysis) and by Read's, modified Read's, and Gales' formulæ has been made on two hundred and fifty patients.
2. There is a large margin of inaccuracy in the formulæ determination. In only approximately one-fifth of the cases was there an error less than 5%, whilst in over 30% of cases there was more than 20% error. It was noted that very frequently when low basal metabolic rates were obtained by gas analysis the formula gave higher readings. The reverse occurred in hyperthyroidism, and here lower readings were frequently observed.
3. The formula might find some practical value as a method in difficulties if its limitations were recognized. Possibly it could be used to follow up patients with hyperthyroidism who were under treatment, provided the initial value of the gasometric result were known. Even here its results are not conclusively diagnostic.
4. The percentage and margin of error by formulæ are too great and incalculable. It does not allow a sufficiently certain estimation, especially in important and difficult cases. Justification is therefore felt in issuing a warning against making a final diagnosis from the use of formulæ alone.
5. Deviations of gasometric basal metabolism from the normal are alone insufficient proof of an

endocrine upset and are only to be used diagnostically in association with the total clinical picture.

6. The gasometric analysis for determination of the basal metabolic rate cannot be supplemented or replaced by formulae.

Acknowledgements.

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SOME NOTES AND COMMENTS ON SURGICAL RECORDS OF THE BRISBANE HOSPITAL DURING THE LAST QUARTER OF A CENTURY.¹

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IN the brief space of thirty minutes that is allowed for the reading of this paper it is not possible to consider in detail the history of surgery at the Brisbane Hospital during the past twenty-five years. Though this period is a mere fraction of the æons that have gone, its passing has witnessed some of the most momentous happenings in history, and as to the effects of these happenings none can foretell.

In order to save time, let me allow the figures that I place before you to tell as much of my story as possible.

TABLE I.

Total Operations and Percentage to Population of Greater Brisbane.

Year.	Total Operations.	Percentage of Operations to Population of Greater Brisbane.
1910	1,589	1.09
1924	2,920	1.13
1935	10,046	3.29

NOTE.—These operations include all major and minor operations performed at the Brisbane Hospital, including such minor procedures as suturing wounds.

TABLE II.

Percentage of Increase of Total Hospital Admissions Compared with Percentage of Increase of Population of Greater Brisbane.

Group Showing Increase.	From 1910 to	
	1924.	1935.
Admissions	% 78.0	% 206.7
Population	% 59.0	% 110.0

Table II is an interesting table and shows that, though the population increase over 1910 was 78%, the hospital admission increase was only 59% in 1924. There are several factors that must be taken into account: First, the Mater Misericordiae Public Hospital was not in existence in 1910, and since its inception a large number of patients who formerly were accommodated in the Brisbane Hospital are now cared for in the Mater Misericordiae Hospital. Secondly, other public hospitals of a semi-public nature (such as the Rosemount Military Hospital and the Red Cross Hospital, "Ardoyne") came into being and admitted patients. Thirdly, the early years of the third decade of the century were a period of reorganization at the Brisbane Hospital, and at this time there was a shortage of in-patient accommodation.

¹ Read at a meeting of the Queensland Branch of the British Medical Association on August 2, 1935.

In spite of the presence of other hospitals in 1934, while the population increase over 1910 was 110%, the hospital admissions increased by 206.7%.

TABLE III.
Epitome of Operations.

Type of Operations.	1910.	1924.	1934.
Abdominal operations	194	431	1,156
Amputations	45	38	54
Operations on new growths	94	96	378
Operations on bones and joints ..	82	247	902
Genito-urinary system operations ..	153	110	525
Operations on rectum	31	19	94
Operations on chest	4	12	219
Throat, nose and ear operations ..	123	453	1,156
Gynaecological operations	193	412	1,327
Operations on the eye	94	175	764
Miscellaneous	576	927	3,411
Total	1,589	2,920	10,046

Filariasis.

	Cases.
1910	21
1935	7

The period under review, 1910-1935, is one of great interest. The earlier date marks the closing of the fifty years following the beginning of the period that owes so much to the genius of Pasteur and Lister. The outstanding event of the commencement of the succeeding period is the Great War of 1914-1918.

The list of operations for 1910 is indicative of surgical practice of the pre-war Listerian period. The visiting surgical staff of this period consisted of graduates of British and Australian universities, all of whom had, of course, in their training imbibed the principles of Listerian practice. Their reputations stood high as exponents of the surgical art. The senior surgeon for 1910 was our well-known historian of the earliest days of the Brisbane Hospital, Dr. E. S. Jackson, well known to you all. He has given us the biographies of the hospital surgeons up till 1870, and I trust you will persuade him to bring this up to date by dealing with the period 1870-1910. Of the remaining visiting surgeons it is sad to reflect that all have passed the Great Divide: G. H. Hopkins, R. A. Meek, J. M. McEncroe, T. H. Morgan and J. D. Buchanan. These men reflected in their practices the surgical principles handed down by a long line of teachers whose art extends into the mists of antiquity. One has beguiled many hours listening to some of these men telling the stories of the giants of other days.

In the period immediately prior to the War it would appear that the impetus surgery derived from the discoveries of Pasteur and Lister had reached its maximum effect. Surgical practice had become standardized and the rate of progress slackened. At this time there occurred the outbreak of the World War, and it is unquestionable that the War had an enormous effect in relationship to the present practice of surgery at the Brisbane Hospital, as elsewhere. There can be no doubt about it that

the post-war period was one of surgical renaissance. In addition to the lessons of war surgery which were learned and applied to civil practice, the great majority of the present staff of the hospital underwent post-graduate training in the Home Country. In fact, the War provided an opportunity of post-graduate instruction on a large scale such as had never before been experienced. Surgeons who, on their return from active service, became members of the staff, had received instruction in the various surgical departments of world-famous hospitals. In the latter period at the hospital we find that new departments have sprung up, such as orthopaedics, urology and radium departments.

Let me draw your attention to the heading "Filariasis", which disease apparently is becoming much more infrequent than heretofore. When I was a resident medical officer at the hospital this disease was commonly seen, and at times presented great difficulty in diagnosis—it simulated such conditions as strangulated hernia and acute appendicitis. These difficulties in diagnosis were taught to a succession of resident medical officers by the honorary surgeons and Dr. J. B. McLean, whose experience was most extensive. Some of the authorities in tropical medicine may be able to explain the diminution of this affection.

It is impossible for me to compare all the items in the list of operations, even if I were capable of so doing. In the gynaecological, ear, nose and throat, and orthopaedic sections there has been an enormous percentage of increase in the 1935 list over those of 1910 and 1924. It is impossible to make a complete comparison in the short space of time at our disposal of all the operations, but I wish to show Table IV, which, I think, is instructive.

TABLE IV.

Operation.	1910.	1924.	1935.
Appendicectomy	60	217	521
Appendicectomy (with colopexy) ..	—	—	19
Herniotomy, inguinal	59	37	185
Cholecystectomy	—	3	89
Cholecystostomy	4	13	4
Gastrectomy	—	—	7
Excision of gastric ulcer	—	3	—
Gastro-enterostomy	2	9	7
Amputation, thigh	—	1	2
Amputation, leg	2	7	13
Amputation, arm	1	1	2
Prostatic resection	7	11	77
Cystoscopy	4	9	92
Empyema	4	10	23
Thyroidectomy	4	1	63
Phrenic avulsion	—	—	6
Cure of ruptured gastric ulcer ..	—	12	16
Cure of ruptured duodenal ulcer ..	—	6	8

You will note that the number of operations coming under the heading "stomach" is very small. I am not able to say whether this is due to a relative immunity to these complaints or whether sufferers are treated by other than surgical means. Perhaps the physicians can supply details which would increase the figures to a number equal to those of the gall-bladder figures.

I wish to make some more lengthy comment under the headings "Cholecystectomy" and "Prostatec-

tomy". In 1910 no case of cholecystectomy is reported in the list, and the development of the modern operation for removal of the gall-bladder has been one of the triumphs of the last twenty-five years. Personally I am under a debt of gratitude to Dr. Devine, of Melbourne, who has taught the use of his very ingenious abdominal retractor as an important part of the technique of this operation. Paradoxical as it may appear, since learning the use of the retractor, we have found that in a great number of cases, owing to the extra knowledge gained, we have been able to dispense with the use of this instrument. This is all very well in a base hospital, where there is ample skilled assistance, but under some conditions of country practice its use must be invaluable. The instrument allows the operator free use of both hands and allows for adequate exposure, that essential of safe and expeditious surgery.

I present a small series of consecutive cases of cholecystectomy (collected since our records have been improved) which you may find interesting. It does not, of course, compare with the very large lists of teaching hospitals. (See Table V.)

Of the 37 patients subjected to cholecystectomy, 29 were females, 8 were males. Thirty-six recovered and one died. The age periods and the number of gall-stones are shown in Table VI.

TABLE VI.

Age Period.	Stones.	No Stones.
21 to 30 years	6	2
31 to 40 years	3	5
41 to 50 years	8	1
51 to 60 years	4	1
61 to 70 years	7	
	28	9

Graham's test was performed in 24 cases, and the report was correct in 22. Pathological examinations were performed in 28 cases.

In regard to symptomatology, it will be noted that all patients suffered from pain, which was taken as evidence of biliary colic, and that in the great majority of cases the pathological examination revealed a severe degree of damage to the gall-bladder. In the large majority of cases Graham's test proved to be correct. In Case XXXIII "pathological gall-bladder" was the X ray diagnosis, whereas the microscopic section was "histologically normal".

Mackey⁽¹⁾ points out that occasionally the X ray and histological findings are difficult to reconcile. He reports that many authors maintain that patients with a history of biliary colic are practically certain to do well after operation, while patients without such history are likely to do badly. It would appear that patients suffering from flatulent dyspepsia and inability to take certain foods, and showing variations in cholecystographic findings, may undergo operation. These patients, however, are not so likely to get relief from opera-

tion as those in whom biliary colic is a prominent feature. Mackey's article is worthy of careful study.

B. O. Pribram⁽²⁾ also writes an interesting article, in which he states:

We now resort to cholecystectomy only in those cases in which the gall-bladder has been completely destroyed and its function therefore lost. Moreover, we are confronted with a new problem, not only to conserve the bladder, but to restore its lost function, if possible.

He goes on to describe how this is done by the operation (the name is somewhat of a tongue-twister) cholecystocholedochostomy.

Just a word about jaundice. I should like to draw your attention to an article by McNealy⁽³⁾ and others, who write:

Before cholecystectomy or choledochotomy, if the Ivy bleeding time is normal, the prognosis is good, even without specific preparation. If the Ivy bleeding time is prolonged, the operative prognosis is bad. In these patients Viosterol for four days to two weeks will usually reduce the bleeding time to normal and insure a smooth post-operative recovery.

As these cases of jaundice are difficult to manage, I think it would be worth while to test the thesis expounded in this article.

I now wish to make a few remarks under the heading "Prostatectomy". A good deal has been written in recent years of the mortality of this operation, and reports of lists of cases at teaching hospitals reveal the mortality as high as 25%. Renal and cardiac insufficiency and post-operative hæmorrhage are amongst the well known causes of the mortality, and the means of their prevention is well known. The question of associated infection, such as that due to pyelitis and pyelonephritis, has not received perhaps full attention, and the reason may be that a complete renal examination is not carried out in all cases when it is really necessary. In order to determine the exact type of obstruction present, a cystoscopic examination is necessary in many cases; the type of treatment adopted will depend upon the finding.

In published series of mortality rates one rarely notes that the percentage of occurrence of fibrous prostate is mentioned. McAlpine⁽⁴⁾ is of the opinion that *prostatism sans prostate* is a rare disease and that many of these cases are due to that type of prostatic enlargement which is sub-sphincteric. It would appear that a great deal more work requires to be done on the pathology of bladder neck obstruction. Clinically there are two types: one in which enucleation is easy, and the other in which it is extremely difficult, these being cases of fibrous prostate, and I think that this class of case provides a large share of operative mortality. I now show you some microscopic sections of the bladder neck indicating the muscular arrangement. For full details I would refer you to McAlpine's very interesting article. It is difficult to see why obstruction occurs in such cases. Perhaps the cause is nervous and not muscular, and in the future may be treated by some form of sympathetic nerve surgery.

Buried away in the records are reports of many interesting cases, and I think it is a pity that the

TABLE V.

No.	Sex.	Age.	Symptoms.	X Ray Finding.	Pathological Report.	Cholesterol and Calcium Estimations.	Van den Bergh Reactions.	Stones.	Result.
1	F.	54	Pain seven days ago in right epigastrium; vomiting; flatulence; swelling of abdomen after meals, worse after fatty foods; loss of weight in last three months; eyes yellowish; symptoms evident two years.	No sign of dye in gall - bladder. Pathological gall-bladder (?).	Almost complete atrophy of mucosa, with marked fibrotic thickening of all coats.		Immediate direct.	No stones.	Recovered.
2	F.	45	Sharp attack of pain in right side of ninth costal cartilage region, and sometimes pain between shoulders; indigestion after meals; vomiting; has had indigestion for six years.		Gall-bladder shows extensive inflammatory reaction. Wall composed of very thick fibrous tissue. Mucous membrane is atrophic. Extensive hemorrhage below mucous membrane.			Stone in cystic duct.	Recovered.
3	F.	22	Frequent attacks of pain in right side of abdomen and between shoulders; vomiting; symptoms evident for last nine months.	No gall-bladder shadow. Pathological gall-bladder (?).	Chronic inflammation. Fibrosis of all coats.			Stone close to Vater's ampulla.	Recovered.
4	F.	64	Pain in upper part of abdomen; dry retching; symptoms present during last four years. This patient suffered from diabetes.	Large gall-stone; biliary calculi.	Pure cholesterol calculus.			Large stone almost filling gall-bladder.	Recovered.
5	F.	47	Vomited for four hours after eating tongue and pork; vomiting greenish matter and few small pieces of reddish tissue; dull aching abdominal pain; shivering, temperature 35.6° C. (96° F.) on admission to hospital; indigestion five to ten years.	No gall-bladder shadow visible. Pathological gall-bladder (?).	Atrophy and de-squamation of mucosa, with hyaline degeneration of musculature.			Several stones.	Recovered.
6	F.	50	Sudden severe abdominal pain in epigastrium and radiating backwards; vomiting; indigestion and flatulence, particularly after food; symptoms evident five months.	No gall-bladder shadow. Possibly some disturbance of the gallus viscus.		12.5 milligrammes of calcium. 123 milligrammes of cholesterol.		Several mulberry-shaped stones in cystic duct and common duct.	Recovered.
7	F.	43	Severe pain in right hypochondrium; nausea; urine dark; gall-stones removed seven years ago.	No gall-bladder shadow present. Pathological gall-bladder (?).	Gall-bladder inflamed.			No stones.	Recovered.
8	F.	30	Colicky pain in right hypochondrium; headache; urine dark during attacks; has passed gall-stones (seen by doctor); symptoms evident for last six months.	Practically no dye absorbed in gall-bladder; numerous shadows, undoubtedly biliary calculi.	Numerous small abscesses, sub-mucous where mucosa is intact; ulcers giving directly on to the lumen of viscus where mucosa has sloughed. In other places there is epithelial hyperplasia in the tubules of the mucosa, heaping up, and in some places solid epithelial plugs. Condition is irritative in origin and is pre-cancerous.	10.6 milligrammes of calcium. 148 milligrammes of cholesterol.		Twenty-four small stones.	Recovered.

TABLE V.—Continued.

No.	Sex.	Age.	Symptoms.	X Ray Finding.	Pathological Report.	Cholesterol and Calcium Estimations.	Van den Bergh Reactions.	Stones.	Result.
9	F.	38	Sudden onset of pain in upper part of abdomen and between shoulders; attack lasted four days; vomiting; no previous attack.		Mucosa completely necrosed and replaced by organized thrombus; other coats enormously thickened by fibrosis.	10.0 milligrammes of calcium. 132 milligrammes of cholesterol.		One large stone about one and a half inches in diameter.	Recovered.
10	F.	62	Pain in right iliac fossa at intervals during last two years; worse lately; pain colicky in nature, and made worse by purgatives or by stooping and lifting; abdomen distended at times.	Dye does not appear to have entered gall-bladder; possibly disturbance of viscus.	Wall of gall-bladder, though fibrous, is thinned; at one site is small focus of active subacute inflammation; epithelium is proliferative, though not malignant.		Negative.	Several small stones.	Recovered.
11	M.	56	Gall-bladder drained 14 years ago; nine months ago developed pain beneath right costal margin; pain eased by lying down; skin jaundiced for few days after attack; vomiting; urine dark; indigestion and flatulence.	No shadow present; pathological gall-bladder (?).	Mucosa almost completely atrophied; the rest of wall of viscus is fibrous tissue.			One large stone.	Recovered.
12	M.	62	Attacks of colicky pain in right hypochondrium; flatulent dyspepsia; vomiting; shivers; slight jaundice; clay-coloured stools; loss of weight; attacks over period of 18 months.					Gall-bladder full of stones.	Recovered.
13	F.	28	Colicky pain in right hypochondrium, radiating between shoulder blades; slight jaundice; constipation; attacks at fairly frequent intervals for last three and a half years.	No evidence of gall-bladder shadows; pathological gall-bladder (?).	Slight catarrhal inflammation and tendency to desquamation.	11.6 milligrammes of calcium. 174 milligrammes of cholesterol.	Negative.	No stones.	Recovered.
14	F.	52	Severe pain below right costal margin, radiating to back and between shoulders; vomiting; jaundiced.	No gall-bladder shadow visible. Pathological gall-bladder (?).		10.8 milligrammes of calcium. 228 milligrammes of cholesterol.	Indirect.	Gall-bladder full of stones.	Recovered.
15	F.	53	Flatulent dyspepsia for years. Two days ago developed dull aching pain in epigastric region; continuous pain; vomiting; first attack three years ago.	Gall-stones seem to be apparent.		9.7 milligrammes of calcium. 150 milligrammes of cholesterol.	Negative.	One large stone.	Recovered.
16	M.	34	Pain in head, back and abdomen; symptoms evident during last ten months; patient foreign and unable to give much information.	Shadow present suggestive of stones.	Cystic dilatation of mucous glands; cholesterol in submucous tissue.	196 milligrammes of cholesterol.		Seven small soft mulberry stones.	Recovered.
17	F.	40	Chronic indigestion; severe pain in right side of abdomen all night; vomiting if takes food or drink.	Shadows suggestive of gall-stones; no X ray evidence of gall-bladder shadow.	Advanced stage of severe chronic inflammation; sloughing of mucosa; thickening of all layers of viscus; much necrosis and hæmorrhage under serosa.			Several stones.	Recovered.

TABLE V.—Continued.

No.	Sex.	Age.	Symptoms.	X Ray Finding.	Pathological Report.	Cholesterol and Calcium Estimations.	Van den Bergh Reactions.	Stones.	Result.
18	F.	42	Attacks of shooting pain in epigastrium for last eight months; loss of weight; flatulence; indigestion; anorexia; constipation; jaundiced during attacks; urine dark and faeces pale; vomiting when pain is severe; scalding of urine; fatty foods disagree; symptoms first evident four years ago.	Pathological gall-bladder by Graham's test.				No stones.	Recovered.
19	M.	62	Pain started suddenly in bed across upper part of abdomen; vomiting; jaundice.					Some small stones.	Recovered.
20	F.	22	Three weeks ago developed sudden severe pain in right hypochondrium; numerous attacks since then; vomiting; present attack five days duration.		Wall of viscus enormously thickened, due mainly to hypertrophy of the muscular coat.		Indirect.	Many small stones.	Recovered.
21	F.	42	Has had attacks of pain during past four years; present attack commenced four days ago; severe upper abdominal pain, colicky in nature; vomiting.	No evidence of dye having entered gall-bladder; evidently an infected gall-bladder.	Gall-bladder enormously thickened, due to increase in depth of sub-mucous connective tissue which is extremely vascular; mucosa has sloughed away, not neoplastic.			Many small stones.	Recovered.
22	F.	45	Frequent attacks of pain during last eleven years; flatulence; attacks more severe lately, and more frequent.	No evidence of dye having entered gall-bladder; evidently pathological.	Mucosa thinned and ulcerated.			Several stones.	Recovered.
23	F.	28	Epigastric pain on and off for twelve months; pain radiates to shoulders; vomiting; flatulence; loss of weight.	Pathological gall-bladder.	Whole thickness of the wall grossly infected, there being numerous small abscesses; mucosa completely sloughed away; curious areas of hyalinization of musculature.			One stone.	Died. Autopsy showed no cause other than operative shock.
24	M.	45	Readmission after three days out from Ward 3; felt sick when going to bed; pain in right side; next morning vomited greenish fluid; cannot retain food.	No gall-bladder shadow; pathological gall-bladder.	Mucous membrane ulcerated; intense acute inflammatory reaction; wall greatly thickened, showing subacute and chronic inflammation.			Three stones.	Recovered.
25	M.	57	Indigestion and wind for twelve months; last six months attacks of pain under right costal margin, going through to scapula; jaundiced with last few attacks; urine usually dark after attack.		Mucosa acutely inflamed and sloughing in places.			Several stones.	Recovered.
26	F.	44	Attacks of severe abdominal pain during last two years.	Pathological gall-bladder (?).	Mucosa acutely inflamed and sloughing.			Numerous stones.	Recovered.

TABLE V.—Continued.

No.	Sex.	Age.	Symptoms.	X Ray Finding.	Pathological Report.	Cholesterol and Calcium Estimations.	Van den Bergh Reactions.	Stones.	Result.
27	F.	43	Attacks of pain under right costal margin during last few years; vomiting greenish fluid; affected by food.	Shadow present in gall - bladder region; suggests gall-stones.	Wall much thickened by subacute inflammation.			Three large stones.	Recovered.
28	F.	68	Bilious attacks for many years; last Friday severe pain in hypochondriac region, shooting through to back; vomiting much bile.	Pathological gall-bladder.				Stones in cystic duct and gall-bladder.	Recovered.
29	F.	55	Attacks of epigastric pain for some years; digestion easily upset; fatty foods have bad effect.	No gall-bladder shadow; pathological gall-bladder.	Very much thickened gall-bladder, with atrophy of mucosa.			Several stones.	Recovered.
30	F.	62	Shortness of breath on exertion; sallow in appearance; pain in right hypochondrium, shooting round to back; wind and nausea; cold sweats and shivers; stools pale; feeling as of something in throat.	Very poor entry of dye into gall-bladder; shadow suggests one large gall-stone.	Mucosa shows very small abscesses with some sloughing; wall of the organ generally is not altered or thickened.			Several stones.	Recovered.
31	F.	65	Sudden onset of severe abdominal pain, colicky in nature; vomiting frequently.	Pathological gall-bladder.				Two small stones.	Recovered.
32	F.	24	Indigestion for last ten years; three weeks ago developed pain under right costal margin, shooting through to back, and radiating to shoulder; jaundiced; pain returned this morning; urine red.	Gall-bladder shows no shadow; pathological gall-bladder.	Gall-bladder shows no change; the mucosa is intact and healthy.			No stones.	Recovered.
33	M.	44	Seven weeks ago developed severe pain in precordium; cold shivers; vomiting; pain ever since (thought to be pleurisy); shortness of breath; symptoms first evident four years ago.	No shadow visible; pathological gall-bladder.	Electrocardiograph diagnosis: myocardial involvement.			No stones.	Recovered.
34	M.	46	Six weeks ago developed sudden acute pain in right costal margin; two recurrences since; pain colicky in nature.		Considerable hyperplasia of muscular coat, irritative in origin; so much overgrowth and active proliferation that condition is probably neoplastic, classed as myosarcoma.			Malignant gall-bladder.	Recovered.
35	F.	42	Sharp epigastric pain, radiating round right costal margin to right scapula; vomiting during attacks; flatulence; upset by fatty foods; symptoms first evident seven years ago.		Chronic inflammation; great thickening of muscular coat and atrophy of mucosa.			No stones.	Recovered.
36	F.	28	Sudden onset of pain in right of chest; pain occurs once daily for about half an hour; dry retching; nauseous occasionally; tastes bile in mouth.		Chronic inflammation and atrophy of mucosa.			Two stones.	Recovered.
37	F.	22	Severe pain for whole day.		Catarrhal inflammation.			Several small stones.	Recovered.

more interesting of these are not collected and preserved in a special record in the archives of the hospital. Such records would be invaluable in dealing with unusual cases, and one has frequently felt the need of some such reference. In smaller centres there are not the number of cases met with as in more populous places, but surgical affections are no respecters of geographical situation, and at times decisions as to the best method of treatment are notoriously difficult. Let me give one or two examples.

A patient under the care of my colleague, Dr. Alex. Murphy, was suffering from an abscess of the lung following upon tooth extraction. The abscess (a small one) was situated right in the centre of the upper lobe of the left lung and, in spite of non-operative treatment, the patient was going down hill. The problem was: should the abscess be attacked through the antero-lateral or posterior approach? We were not so fortunate as to be able to obtain a list of appropriate references. In this case a posterior approach was used, the two-stage method employed, and, fortunately, the patient recovered.

A second case of interest was that of a man who had been horned by a cow with a crumpled horn.

He came to us with a very dirty rectal wound and a fecal fistula coming through the *gluteus maximus* muscle. Though we searched all our literature we could find very little of use bearing on this case. It is hoped to publish the details of this case at a later date.

In preparing this paper I have experienced great difficulty in obtaining the figures that I required, and had it not been for the assistance of Mr. Sears, who looks after the records of the hospital, to whose help I am very much indebted and to whom my best thanks are due, I should not have had them at all.

I have published no comparison of results of treatment, as this is a most difficult matter and a time-consuming one. It appears to me that all hospitals should have follow-up departments and record systems in which there is some measure of standardization, so that comparisons with other institutions may be made.

Curing the sick is one of the greatest industries in the State, second only to the production of new citizens, and as such is worthy of an adequate system of medical accountancy. The dividends that accrue merit the small relative cost of establishing the necessary accounting department.

Another difficulty we have here is that of reference libraries. Scattered throughout the city are a number of small medical libraries. If we are to do adequate medical research in the future, we require a good central library and (equally important) a librarian.

I understand there will be a possibility of establishing such a library as part of the new University library, and I am sure you will all be impressed with the importance of such a project.

This meeting tonight is an historic occasion—it is the first meeting of the Branch to be held in the Anatomy School of the University of Queensland. The achievement of the Anatomy School is preeminently due to the work of Professor E. J. Goddard, Professor of Biology in the

University of Queensland. Professor Goddard has, I think, done more than any other man to promote the medical and allied sciences of this State. At the same time I think mention should be made, with regard to the achievement of the Anatomy School, of the work of two of our colleagues on the Brisbane Hospital staff, Dr. E. S. Jackson and Dr. J. V. Duhig, who did years of work in paving the way for present achievement. In addition, our President, Dr. W. N. Robertson, was a member of the committee appointed by the Branch in connexion with the School of Anatomy, and, as you know, is chairman of the committee appointed by the Government to report on a medical school for Queensland.

I trust this will be the forerunner of many meetings in this building, so that we may make full use of the dissecting room for demonstrations. We propose to have the first of these demonstrations tonight, and I ask you to adjourn now to the dissecting room.

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CONVERGENCE-ACCOMMODATION AND PUPIL CONTRACTION.

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In modern neurological text-books varying accounts appear of the afferent limb of the reflex arc subserving pupil contraction and increased lens convexity in response to convergence of the eyes. Some accounts, though full of detail, do not appear to be supported either by experimental or histological evidence. Hewer and Sandes⁽¹⁾ state:

The pathway of accommodation is from the occipital lobe, which receives the afferent fibres from the retina, to the frontal cortex. From this cortex the fibres run through the genu of the internal capsule and the medial part of the crus to the nuclei of both third nerves.

Rasmussen⁽²⁾ writes:

The accommodation reflex passes from the retina largely to the visual cortex and back to the superior colliculus, thence to the nucleus of the oculomotor nerve and out through this nerve to the ciliary ganglion.

Sampson Wright⁽³⁾ states:

Convergence-accommodation is to some extent a willed movement, as the object must be definitely looked at before it occurs. It is believed that visual impulses pass to the occipital lobe and are relayed to the frontal lobes. Fibres arise here which descend in the genu or anterior limb of the internal capsule to reach the inner part of the *pes pedunculi*. These cortico-nuclear fibres then turn abruptly dorsally through the mesial fillet to the opposite side, to end in the third nerve nucleus.

Morat⁽⁴⁾ also according to Wilkinson⁽⁵⁾ has stated that:

The afferent path of pupillary reflexes arises in the retina and following on this conception that the fibres concerned in the accommodation reflex form a set distinct from those which form the afferent path in the light reflex.

Oppenheim's rather radical assumption is that the voluntary impulses which produce contraction in the medial recti simultaneously reach the sphincter iridis.⁽⁶⁾ Bing⁽⁷⁾ conservatively states: "The nature of the lesion on which depends the Argyll-Robertson pupil is not yet fully established." Wilkinson,⁽⁵⁾ drawing his conclusions from a series of ingenious experiments, observes:

Lateral rotation of the eye is associated with momentary pupillary dilatation in the same eye and that medial rotation is similarly associated with momentary pupillary contraction in the same eye. The reflex arc for contraction of the pupil on accommodation . . . passes via the oculomotor nerves to the third nucleus.

There are two schools of thought here then. One believes that the afferent side of the reflex arc for convergence-accommodation carries proprioceptive impulses from the extrinsic ocular muscles via the oculomotor nerves direct to the oculomotor nucleus. This view has the support of the histological evidence presented many years ago by Tozer and Sherrington,⁽⁸⁾ who described a rich supply of

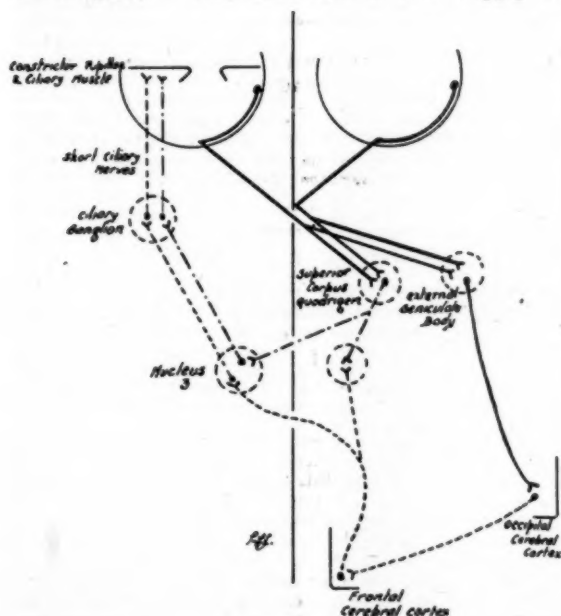


FIGURE I.

Diagram after Hewer and Sandes to show paths for the light reflex and for accommodation. Accommodation is shown by the line with dashes; light reflex by the line with dashes and dots.

tension receptor nerve endings in the extrinsic ocular muscles. The centripetal fibres from these endings were said to pass into their unipolar cells of origin scattered along the courses of the oculomotor and abducens nerves, and the central processes of these cells were continued centrally in the

same nerves. In spite of the disparity of detail in the statements made by the protagonists of the other school, they all possess one factor in common, namely, the belief that afferent impulses concerned in accommodation arise in the retina and pass to the visual cortex. This common statement appears to be a matter of opinion only, as it is in no case supported by objective evidence. Since this theory

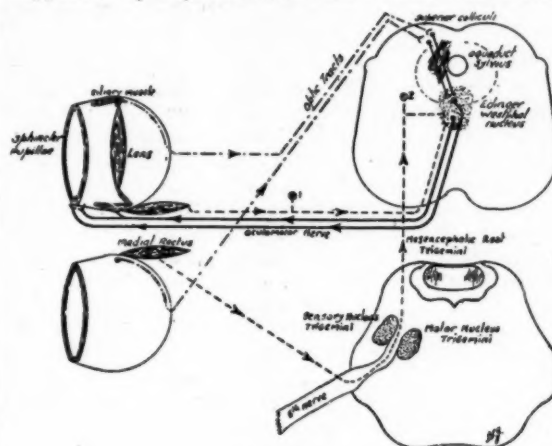


FIGURE II.

Diagram showing the arcs for intrinsic ocular reflexes. The shaded area adjacent to the aqueduct of Sylvius indicates the site of lesion producing the Argyll-Robertson pupil. 1 and 2 indicate the alternative sites for the cells of origin of afferent fibres from extrinsic ocular muscles.

requires that an object be looked at (for example, that its image should fall on the two maculae) and be perceived in the visual cortex in order that accommodation take place, it is at once liable to criticism. No record can be found of any finding at all resembling the Argyll-Robertson type of pupil either in patients with bilateral central scotomata or in others with hemianopic or quadrantic defects involving the maculae. Absence of convergence-accommodation is not associated either with large neoplasms in the region of the Rolandic area or with vascular catastrophes in the internal capsule. The most direct evidence that the afferent limb of the reflex arc concerned in accommodation does not arise solely from the retina is provided by a case report by Dunn,⁽⁹⁾ who described the presence of the accommodation reflex in a negro who was totally blind in both eyes. In support of this evidence the following observations are submitted.

A.A., a male, aged thirty-two years, was admitted to Lewisham Hospital on January 15, 1935, suffering from the effects of a motor cycle accident which had taken place about twenty minutes previously. On examination he was found to have suffered the following injuries: compound fracture of the skull, compound fracture of the mandible, fracture of the second, third, fourth, fifth, seventh, eighth and tenth ribs on the right side, and compound fracture of one phalanx. After a hazardous convalescence, during which he developed a lung abscess, he recovered. He was comatose for the first three days after admission, and when he became conscious it was discovered that he was completely blind in the right eye. The right pupil was circular, central, but larger than the left, and there was no direct light reflex in the right eye. The consensual reflex was present. All external ocular movements could

be carried out fully and freely. The right optic disk was definitely pale. The patient was discharged from hospital on March 8, 1935, when it was again noted that there was no light perception in the right eye; the direct light reflex was absent; the third, fourth and sixth nerves on the right side were all functioning normally, and the right optic disk by this time displayed the classical picture of complete primary optic atrophy. The movements and light reflexes of the left eye were all normal.

It appeared, then, that the right optic nerve had been completely divided or crushed without any interference with the third, fourth and sixth nerves on the right side. When the patient was ordered to converge the eyes (both eyes being open), both pupils contracted equally. With the left eye closed and the right open (that is, with no nerve impulses reaching the visual cortex), the right pupil again contracted when the eyes were converged. This convergence-accommodation reaction in the blind eye when the left eye was kept closed has been tested many times in the past six months and has been noted by many observers. It has not altered since the patient's discharge from hospital. Attempts have been made to record photographically the change in the relation between images reflected from the anterior surface of the cornea and the anterior surface of the lens during accommodation. The intensity of the image from the anterior surface of the lens, however, has proved too weak to be photographed, although it can be observed with the naked eye after some experience. Under direct observation the image from the anterior surface of the lens could be seen to approach that from the surface of the cornea when the eyes were converged with the left eye closed, indicating that the ciliary muscle as well as the *sphincter pupillæ* contracted in response to impulses, presumably proprioceptive from the extrinsic ocular muscles, set up when the eyes converged and with no light impulses reaching the visual cortex.

Although the evidence indicates that afferent impulses subserving accommodation are proprioceptive from the extrinsic ocular muscles, the centripetal pathway of these impulses is still unknown. It may be that they pass centrally in the third and sixth nerves, as described by Tozer and Sherrington. On the other hand, it is worth noting recent observations by Nicolesco⁽¹⁰⁾ and Tarkhan.⁽¹¹⁾ The former writes:

It is obvious that these (the cells of the mesencephalic root of the fifth nerve) underlie the function of proprioceptive activity. From the standpoint of comparative anatomy it would seem that the mesencephalic cells may have to do with the sensibility of the extrinsic muscles of the eyeballs.

Tarkhan states:

It is therefore justifiable to conclude that the proprioceptive fibres from the muscles supplied by the third nerve take origin from those cells of the mesencephalic nucleus which are related to the tecto-spinal tract.

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Reports of Cases.

LIGATION OF EXTERNAL CAROTID ARTERY TO CONTROL TONSILLAR HÆMORRHAGE.

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W.A.C., A FEMALE, aged thirty-four years, was seen in November, 1932, suffering from an acute left *otitis media* secondary to a recent acute tonsillitis, to attacks of which she was very subject. On discussing with her the advisability of having her tonsils removed later, she replied: "Yes, I know I should, but our family are all bleeders and I had a terrible time with my teeth."

I did not see her again until May, 1935, when her practitioner referred her concerning a tonsillectomy, as she had been having recurrent attacks of tonsillitis and showing evidence of focal infection. Since I saw her first in 1932, she had married and had given birth to a full-time child. Her labour was quite normal without tendency to excessive hæmorrhage. Blood examination showed that the bleeding time was two and a half minutes and the coagulation time three and a half minutes. These times were quite within normal limits. The patient was given calcium by mouth for a week preceding, and on the morning of the operation an intravenous injection of calcium gluconate, ten cubic centimetres of a 10% solution.

The tonsils were rather adherent owing to the frequent attacks of inflammation, but were slowly dissected. The venous plexus at the upper pole and the artery at the lower pole were dissected out, ligated and then cut. The lingual processes were twisted and then divided with a cold snare. Although there were no definite bleeding points, both tonsillar beds oozed and remained wet for at least half an hour after completion of the tonsillectomy. The fossæ were painted with 10% silver nitrate solution, and I felt satisfied that all bleeding had ceased when the patient was returned to bed.

Three hours later I was summoned, as she had vomited bright blood three times in quick succession, and on examination both fossæ were full of blood clot, removal of which showed no definite bleeding point, but a generalized ooze. The patient was returned to the theatre and was re-anæsthetized, and an hour was spent in endeavouring to pick up bleeding points, applying caustics *et cetera*. This was quite ineffective and I then tightly sewed bismuth packs soaked in hydrogen peroxide into each fossa. This controlled the hæmorrhage completely on the left side, but on the right blood still continued to well out along the sutures. Further injection of calcium gluconate had been given on return to the theatre.

I then left the mouth for twenty minutes whilst the anæsthetist kept the patient lightly anæsthetized, but on returning found the mouth full of blood, which was coming from the right side only; the pack had apparently fully controlled any further hæmorrhage from the left side. I was satisfied that the pack on the right side was maintaining firm pressure, so did not disturb it.

The patient's condition was still excellent, as she had really lost very little blood, except during the period when

out of the theatre. Her colour was good and her pulse rate had not risen above 88 after her return to the theatre. What was to be done now? I could: (i) Wait for a further hour to see whether the hæmorrhage would cease. This I did not consider advisable, as the bleeding was too free. (ii) Give a blood transfusion. (iii) Ligate the right external carotid artery.

I decided without hesitation in favour of ligating the carotid, as this would save delay and be more certain to control the hæmorrhage from the remaining bleeding area. This was done with immediate cessation of the hæmorrhage, the ligature being applied immediately above the superior thyroid branch.

From then on convalescence was uneventful; the ligatures controlling the packs were divided thirty-six hours later and the patient expelled the packs during that day. The tonsillar fossæ were kept as clean as possible during convalescence by swabbing with hydrogen peroxide and 5% mercurochrome and occasionally by painting with 10% silver nitrate solution. I saw the patient six weeks after operation, when she was very well and had suffered no ill-effects from the ligation of her external carotid artery.

Comment.

1. It is very difficult to classify this patient, but apparently she lacked prothrombin. Possibly she was a female hæmophilic, who happened to be in that normal phase when her coagulation time was measured. One so frequently hears the story of bleeding following teeth extraction in people who give normal results to tests, followed by tonsillectomy without undue hæmorrhage, that one is inclined to disregard that history alone, other than to take perhaps more care in the form of precalcification and to pay greater attention to hæmorrhage during operation.

2. When coagulation time is delayed a preliminary transfusion of 300 cubic centimetres of blood should always be given to make up deficient prothrombin. It is advisable in most cases to withdraw an equal quantity of the patient's own blood before transfusion. At the Children's Hospital delayed coagulation time in a series of hæmophilics has been hastened by intramuscular injection of 30 cubic centimetres of a 30% solution of sodium citrate with effect. I have very little faith in the administration of calcium by mouth, but the chloride or gluconate given intravenously, I am sure, is beneficial, though apparently it was insufficient in this case.

3. Normal parturition is quite usual, even in a true hæmophilic; why the extraction of teeth and tonsillectomy give most trouble is because one is working in an infected area, with not only an increased blood supply to the part, but, more important, spilling of the blood vessels with damage of the elastic fibres and a certain inability of the vessels to retract after division.

EYELASHES IN THE EYEBALL.

By W. B. CLIPSHAM, M.B., Ch.M. (Sydney),
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Case I.

E.D., a farmer, aged thirty-three years, was struck in the left eye with a piece of rebounding tie-wire on February 9, 1935. There was no external bleeding and the eye was a good one prior to the accident. He was seen eleven hours later and the condition of the eye was then as follows.

The common subjective symptoms usually associated with corneal and intraocular injuries were so slight as to be almost absent, there being but slight ciliary injection. The right eye appeared to be normal, with an unaided visual acuity of $\frac{1}{2}$ and Jaeger I, and the movements of the eyes were unimpaired. The pupils were equal, about two millimetres in diameter, and reacted to both direct and indirect stimulation by light. The left pupil was oval,

with its long axis horizontal. The cornea showed a linear penetrating incision, about three millimetres long, situated radially between the pupil and *limbus corneæ* at seven o'clock. Otherwise the cornea appeared normal. The anterior chamber was of normal depth and contained in its lower half four cilia lying on the anterior surface of the iris, mainly parallel with the lower limbal arc, but at different points of elevation, and partially criss-crossed. There was no hyphæmia nor apparent injury of the iris.

The visual acuity of the left eye was $\frac{1}{20}$, and the intraocular tension was practically normal. The *fundus oculi* could not be examined through the undilated pupil. The patient was admitted to hospital and a waiting policy was adopted while he was being treated with mydriatics and fomentations. The pupil dilated slowly, and in three days was three-quarters dilated, revealing an apparently normal *fundus oculi* through a somewhat cloudy medium. The lens had escaped trauma and the vision was still $\frac{1}{20}$.

Seven days later the vision had improved to $\frac{1}{10}$. The patient was comfortable and the injection of the eye only moderate, while the appearance of the cilia in the anterior chamber remained unchanged, the iris apparently remaining indifferent to their presence.

Three weeks later the eye was practically white, with one small tag of adhesion of the iris to the lens in its lowest part, presumably where the wire had touched it lightly. There were no keratic precipitates, and the cornea was clear, apart from the nebula caused by the wound, whilst the cilia, still unchanged in appearance, had sunk to the bottom of the anterior chamber. The ocular media were now clear, the intraocular tension normal, and the vision, with a correction of a +1.25 diopter cylinder at an axis of 160° , was $\frac{1}{10}$. Three weeks later the vision (still under atropine) had improved to $\frac{1}{5}$, with a cylinder of +1.75 diopters at an axis of 160° .

The patient now left hospital, promising to report later, which so far he has failed to do.

The interest in this case was in the apparent lack of subjective symptoms, the mildness of reaction of the eye to the presence of four foreign bodies, all potentially septic, the fortunate escape of the lens from injury, and the recovery of vision from $\frac{1}{20}$ to $\frac{1}{5}$.

From a surgical standpoint it would appear that to have immediately attempted the extraction of four distinct foreign bodies was fraught with more immediate risk than to await further progress or complications in the case, and the result to the present seems to me to have justified that attitude. What the remote risk may be in the matter of possible reaction and late inflammation, secondary glaucoma, or the formation of hair follicle cysts, time alone can tell.

Case II.

J.H., a labourer, aged twenty-five years, was first seen on May 30, 1935, with a history that four days previously he had been struck on the left eye with a chip of wood. Vision in the eye, previously good, was now blurred and getting worse. There were dull pain and photophobia. The general health was stated to be good, and the teeth appeared to be sound. The ocular condition was as follows.

There were some lachrymation and blepharospasm in the left eye, but no muco-purulent discharge. The eye movements were unrestricted. Both pupils were slightly enlarged and feebly reacting from some previous mydriatic drops. The right eye appeared normal, with vision of $\frac{1}{5}$. The left eye had marked injection of a general type; but intraocular tension was about normal. The cornea of the left eye showed a small macula below and to the nasal side of the pupil, but without staining. There was some infiltration around it. There were no keratic precipitates, and the iris pattern appeared normal, whilst the pupil was round and partially dilated. The anterior chamber was of normal depth and contained one cilium adherent by its proximal end to the inner surface of the corneal scar, passing upwards and crossing the anterior chamber, with its convexity towards the temporal side, till the distal end of the cilium rested upon the anterior face of the iris above and nasally at the level of the apparent corneo-scleral junction. The visual acuity of the eye was $\frac{1}{20}$.

The patient was admitted to hospital and the pupil fully dilated with atropine and fomentations, which revealed no lenticular trauma. The intraocular media were sufficiently clear to reveal a normal *fundus oculi*.

As the condition was not improving, it seemed that the only thing to do was to remove the cillum. Hence three days after admission, under cocaine anaesthesia, a keratome incision was made about one millimetre from the limbus above, and an iris hook was inserted to encircle the shaft of the eyelash, which was thus steered to the corneal incision. Here it slipped off the hook; but it was possible to seize the end of the cillum with fine splinter forceps and extract without the danger of again inserting an instrument into the eye, except an iris repositors to free the iris from the corneal wound.

The convalescence was marked by intense inflammation of the eye, considerable pain, and a reduction of the visual acuity for a week or more to the mere perception of large moving bodies. Recovery was rapid when the crisis passed, and the patient was discharged about ten weeks after admission with a comparatively normal eye, except for the scars caused by the accident and the operation, neither of which occupied the pupillary area.

The visual acuity with the eye still under a mydriatic was now $\frac{1}{2}$, with the aid of +1.0 diopter spherical lens and +0.5 diopter cylinder with axis horizontal.

The interesting features of this case were the intense inflammation caused by one cillum, as contrasted with the previous case, in which the eye contained four, with little general upset to the eye. Another feature was the fact that the corneal wound in each case which admitted the lashes was below the pupil, and the eyelid itself was not injured in either case.

Each patient was fortunate to escape without a lens injury. In the second case operation seemed essential to save the eye, and in spite of the severity of reaction, no really harmful result of inflammation occurred.

In each case the full return of vision was very gratifying, and this probably was due in great measure to the fact that both patients were comparatively young men of robust and healthy constitution and with previously sound eyes.

Reviews.

PHILOSOPHICAL FRAGMENTS.

"THE WORLD OF MAN", a book which claims to illustrate that "all man's activities are symbolic of his own nature and past experience", is a compilation from the published writings of the late Dr. Georg Groddeck.¹ It is concerned with the author's interpretation of pictures and works of art in which the unconscious symbolism of the artist has found expression in plastic or pictorial beauty. It is concerned, too, with etymology and the derivation of words, showing how certain of our current expressions have an unconscious symbolism, which, when understood, serves to illuminate the workings of our own minds.

Georg Walther Groddeck was a remarkable man, a man of great learning and possessed of a vivid and poetic imagination. For many years he conducted a sanitarium at Baden Baden, where he was able to study the minds of his patients and analyse the subconscious mental soil in which so many diseases with organic manifestations have their roots. He anticipated Freud in his theory of the unconscious and thereby gained the friendship and admiration of this great leader.

The present volume of Groddeck's essays is compiled from a number of his scientific writings, of which only a few have so far been translated into English, and particularly from his last and most philosophical book, "*Der Mensch als Symbol*" (1932). His writing is lucid and

easy and pleasant to read, although his subjects frequently lead off the beaten track of medicine. Some of his speculations will seem daring to those who have not acquired a psychological insight into their patients' maladies; but they will be stimulating to the medical man whose interests go beyond sutures and scalpels. Groddeck believed in the unity of the organism—that mind and body were one. He saw the subconscious mind in historical perspective, and life as a struggle towards adaptation.

This book will certainly enlarge the mental horizon of the reader whose mind is not shut against speculation. It will probably promote a wider toleration and engender a deeper insight into the problems of sickness and health; for it shows the art of medicine as something bigger than the prescribing of powders or the application of plasters—something which requires such a deep knowledge of the patient as can be obtained only by the physician who cares for his patients.

SLEEP AND SLEEPLESSNESS.

IN "Insomnia and Other Disturbances of Sleep" Dr. Emanuel Miller expresses the view that we must look for the causes of insomnia in physical chemistry on the one hand and psychology on the other.¹ It is stated that the theory which explains sleep as resulting from the accumulation of hypotoxin is corroborated by experiments; but there is no exposition of the theory nor any discussion of the grounds on which it might be validated. *Encephalitis lethargica*, dissociation, somnambulism, narcolepsy, epileptic automatism, night terrors, nocturnal enuresis, hypnotic sleep, dreams, psychoanalysis, alcoholism and drug addiction are dealt with; but for the most part the exposition is too sketchy to be other than confusing to anyone desiring to use this treatise as a primary source of information, and too didactic to appeal to the wider reader. The treatment of insomnia is undertaken by three major methods, namely, physiotherapy, pharmacotherapy and psychotherapy. The efficacy claimed for morphine in allaying manic excitement is contrary to our experience.

The text is marred by too many grammatical errors and misprints, of which a good example occurs on page 7: "Mesencephalic disturbance in the region of the floor of the fifth ventricle." Other passages are obscure, such as: "Henri Roger quotes a case in which a bed placed against a wall which faced the sun during the day suffered the irradiations during the night which disturbed a patient" (page 64).

Notes on Books, Current Journals and New Appliances.

A MEDICAL DICTIONARY.

THE second edition of "A Pocket Medical Dictionary" has been received. The author is Miss Lois Oakes, sister-tutor at Walton Hospital, Liverpool; she is assisted by Professor Thomas B. Davie, professor of pathology at the University of Bristol. The book is designed for the use of medical students, and it makes no claim to being a complete dictionary of medical terms. It should be of considerable value to students and nurses as a pocket reference book. In addition to definitions of a multitude of terms, it contains brief sections dealing with various tests, methods of estimating dosage, the treatment of poisoning, diet *et cetera*. Indeed the wealth of information contained in such a small space is remarkable. As might be expected in a volume of this type, minor inaccuracies may be found readily enough; but they are not sufficient to detract greatly from the value of the book as a whole. We can be the more tolerant of them when we remember that inaccuracies are not confined to pocket medical dictionaries.

¹ "The World of Man as Reflected in Art, in Words and in Disease", by G. Groddeck, M.D.; 1934. London: The C. W. Daniel Company. Crown 8vo., pp. 271, with illustrations. Price: 10s. 6d. net.

¹ "Pocket Monographs on Practical Medicine: Insomnia and Other Disturbances of Sleep", by E. Miller, M.A., M.R.C.S., L.R.C.P., D.P.M.; 1935. London: John Bale, Sons and Danielsson, Limited. Foolscep 8vo., pp. 88. Price: 2s. 6d. net.

The Medical Journal of Australia

SATURDAY, SEPTEMBER 28, 1935.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction, are invited to seek the advice of the Editor.

THE MEETING OF THE FEDERAL COUNCIL.

THE meeting of the Federal Council reported in this issue was both interesting and important—interesting because for the first time in six years each of the Branches was represented by two delegates, important because the questions discussed referred to many intra-professional and extra-professional relationships. Each Branch member contributes through his Branch two shillings a year to the working of the Federal Council. The sum is, of course, ridiculously small for the upkeep of what should be regarded as and what is the link binding together members of the British Medical Association throughout the Commonwealth. In spite of the smallness of his contribution, each member should make himself acquainted with what the Council has done and is trying to do.

In reviewing the recent meeting, we would first of all point out that the question of finance was mentioned. Consideration was deferred on account of a conference which was subsequently held between the Federal Council and the officers of the Parent Body who were in Melbourne to attend the one hundred and third annual meeting of the

Association. At this stage it will suffice to state that the conference was most helpful and will in all probability result in the strengthening of the position of the Branches as united in the Federal Council. In a subsequent issue fuller details of the discussion at this conference will be published. Medical research was discussed in connexion with addresses that were given at the previous meeting of the Federal Council by Dr. J. H. L. Cumpston, Director-General of Health of the Commonwealth, and Sir Colin MacKenzie, of the Institute of Anatomy. The visit of Dr. Cumpston and Sir Colin MacKenzie to the Federal Council was made at the request of Dr. Earle Page, at the time Acting Prime Minister. The Federal Council, after hearing details of the proposed research work to be carried out at Canberra, wrote to Dr. Page, recommending the establishment of a medical research council as suggested by the Royal Commission on Health in its report in 1925. No reply was received from Dr. Page; but at the annual dinner of the British Medical Association, held a few days after the meeting of the Federal Council, Dr. Page used the following words in the course of his reply to the toast of "The Commonwealth of Australia and the City of Melbourne":

I am hopeful that a permanent memorial of your visit to Australia will be the inauguration of a Federal Medical Research Endowment Fund in Australia. I trust that your visit will not merely bring about an added inspiration in the work of the medical profession, but that the publicity given to it and the high tone and character of your discussions and your papers will arouse in the minds of the lay public and of our wealthy philanthropists the idea of contributing to such a fund by means of substantial endowments. We may be able in the future, by reason of such an endowment fund, to see medical research able to be continued on a nation-wide scale, on such a foundation as will make it independent of annual budgets, enabling the best minds to be attracted to it because of the certainty of the continuity of their work. Such a fund, if successfully established, will permit the organization of research into the causes and treatment of disease on the widest possible national lines and prevent the spasmodic and chaotic conditions which usually follow the dependence of research upon annual contributions from governments.

Obviously Dr. Page, as a cabinet minister, is fully aware of the need for the establishment of a medical research council. If and when he replies to the communication of the Federal Council of the British

Medical Association, he should be told that there is no need for the proposed body to rely on annual contributions from the government—the sum of money devoted to research should be a permanent and regular appropriation and not dependent on the whim of any minister or group of ministers. This is a matter in which the Federal Government should take the lead; when it has done so, private benefactors may follow its example.

The news that the fifth session of the Australasian Medical Congress (British Medical Association) is to be held at Adelaide in two years' time will be received with satisfaction. Two years is not a long time for the preparation of a congress, nor is the fixture too far ahead for medical practitioners to note the date and to plan their periods of absence from their practices accordingly. The South Australian Branch may rest assured that with the memory of the very happy, though small, congress at Hobart, and of the elaborate and successful meeting just concluded in Melbourne, members of the Branches will be ready to flock to Adelaide in large numbers. That the Federal Council has seen fit to throw its weight into the movement that finds expression in the Australian Cancer Conferences is, we hope, a happy augury for the future. Too long have some of the Branches withheld their official approval and cooperation. Those who have wished for fuller participation in these conferences by the practising body of the medical profession, will, when the next conference meets in Melbourne, be able to show whether their contentions have been justified.

Other aspects of the work of the Federal Council might be mentioned, but those that have been discussed will show that the Council is trying to carry out what needs to be done and what is not always easy to accomplish.

Current Comment.

PRIMARY PULMONARY TUBERCULOSIS IN CHILDHOOD.

It is well recognized that pulmonary tuberculosis, using the term in its usual application to adults, is not common in children. But perhaps even yet it is not universally realized that primary infection

of the lungs by tubercle bacilli is as common in children as the familiar so-called tertiary disease is in adults. It cannot be too strongly emphasized that there are two stages of the primary lung infection in children: one the subclinical type, that may not be detected at all at the time and only surmised afterwards by the subsequent train of events; the other the type that gives rise to recognizable general and perhaps local disturbance. That the primary focus usually heals we know; that it becomes encased in a firm calcified wall after a couple of years we also know; nor can we forget that it may be reactivated by later inroads on the health and resistance of the child as he grows up, and perhaps by some more or less massive reinfection from without. This last topic is still very controversial, and we may leave it for those others who, in books, at meetings, and more particularly in law courts, rage furiously together whenever the subject is introduced. But we must admit that, even though we are well aware of the mechanism of childhood infection in tuberculosis, we have been too complacent about it. Certainly every effort is made by those interested in preventive medicine to guard young children against the perils of close contact with infected and infectious relatives; but is there enough attention paid to the problem of recognizing the phase of clinical tuberculous infection in these little patients?

A stimulating contribution to the literature is that of Arvid Wallgren, of Gothenberg, Sweden, who traverses the whole subject of the primary tuberculous lung infection of children.¹ There are several points in his paper that may be mentioned as of special importance. He emphasizes the value of the examination of the stomach washings in infants and young children, a method that has been advocated by many paediatricians but that has not been utilized as freely as its value and accuracy warrant. He points out that a positive diagnosis of an obscure febrile state may sometimes be made in the very early stage of pulmonary infection before the lung lesion is demonstrable and before an allergic state has been produced in the child which will cause response to one of the tuberculin tests. Wallgren supports enthusiastically the percutaneous method of carrying out the tuberculin test, using the tuberculin ointment of Hamburger: a small piece the size of a rice grain is rubbed into the skin over the sternum and a reaction takes the form of a papular eruption, which appears in the course of several days and which lasts about a fortnight. Perhaps this method might be further tested in this country; if found as reliable as the Mantoux test, its ease of application would appeal to those who attempt the by no means simple manoeuvre of making a truly intradermal injection on a fractious child.

Wallgren gives a number of instructive charts showing the febrile reaction of the primary tuberculous infection in children, together with the coincident allergic reactions. Another well known

¹ *American Journal of Diseases of Children*, May, 1935.

fact emphasized by this author is the lack of physical signs in the chests of children who actually have a primary tuberculous lesion present in the lungs, a lesion of the pneumonic or allergic variety that is readily demonstrated radiologically. He comments on the amazement that one cannot help feeling on comparing the definite evidence of the X ray film with the apparent normality of the lungs as judged by percussion and auscultation. This is a truth that should be proclaimed loudly to all students of medicine, undergraduate and post-graduate. Two physical signs he mentions as being of some importance where the hilar glands are swollen are expiratory stridor and bitonal cough, the latter being a cough consisting of two elements, one of the usual pitch, the other higher and due to the narrowing of a main bronchus. Such a degree of hilar swelling appears to be uncommon in Australia and, of course, as the author admits, may be due to a variety of causes. Other points of importance in this paper are the use of the blood sedimentation rate, found very valuable by the author, and the significance of a response to the tuberculin test during a febrile illness. As Wallgren remarks, other infections seem to have the effect of reducing sensitiveness to tuberculin; hence a strongly positive reaction has a meaning that is plain. Harking back to the question of demonstration of tubercle bacilli in the gastric washings (or the faeces), we may wonder whether we are not over-optimistic in regarding infected children as non-infective, as is usually done. Probably, as Wallgren states, the risk is small, but in the florid febrile stage it is not entirely to be neglected. Finally more attention should be paid to the care of children during the stage of primary infection. Our more favourable local conditions have made us perhaps less scrupulous than our colleagues in northern Europe; but we should remember that a child in whom a recent tuberculous infection is suspected or demonstrated needs rest, care and thought. Only thus will he be made ready to fight the battles that assuredly lie before him.

CARCINOMA OF THE SMALL INTESTINE.

It is well known that malignant disease of the alimentary tract selects almost exclusively those parts subjected to functional strain. Other portions of the digestive tube, like the small intestine, are so relatively immune to neoplastic change that the possibility is seldom considered. Yet cancer of the ileum and the jejunum occurs, usually at either end, that is, at the distal end of the ileum or the proximal end of the jejunum, the tumours found in these regions being usually adenocarcinomata of the familiar stenosing variety. Attention was drawn to this subject some years ago in this journal by M. P. Susman, who reported three cases, one with recovery, and two discovered *post mortem*. A series of seven cases has been reported by F. D.

Ackman, who has also reviewed the subject in a recent article.¹

Ackman remarks that only seven cases occurred in the Montreal General Hospital in twenty-eight years, during which period over 600 cases of intestinal cancers of all kinds were recorded; this is a lower proportion than the 3% given by Ewing. One very interesting feature of his series is that it includes two young people, one a man aged thirty-three years, the other a woman aged twenty-six years. Remembering that the most significant early symptom of cancer of the colon is local discomfort, it is not surprising that a vague abdominal discomfort was complained of by most of the patients. The duration of these premonitory symptoms was usually a few months, or even longer; but an acute onset with obstruction was also observed. This latter is also in keeping with the known tendency for the adenocarcinoma of the bowel to undergo annular sclerosis. When preliminary discomfort was felt it was usually in the region of the umbilicus, and indigestion, constipation, eructations and loss of weight and strength were also observed by the patients. Of course such symptoms are just what might be expected; but when no obvious cause is found it will be seen that it is not always safe to assume that the small intestine is not the site of a lesion. Ackman points out that the diagnosis is rarely made prior to operation and that the prognosis is bad; six of the seven patients died, and the fate of the remaining patient is unknown. Metastasis may occur either locally or in remote parts, and in several of these cases death was due to recurrence of the growth within the abdominal cavity. It follows naturally that the prognosis is worse than in cancer of the lower bowel, for the surgical treatment involves risks similar to those encountered in operations for obstruction high up in the alimentary tract. These considerations make it all the more important that carcinoma of the small intestine should be suspected when increasing (and usually unexplained) abdominal discomfort, loss of weight and foreshadowing of obstructive phenomena are observed.

THE MELBOURNE MEETING.

THE only duty that remains in connexion with the Melbourne meeting is the publication of the proceedings. Perhaps readers of this journal do not realize that, the meeting being one of the whole Association, this journal has no proprietary rights in the publication of articles. The editor of *The British Medical Journal*, however, has generously waived all question of copyright as far as *THE MEDICAL JOURNAL OF AUSTRALIA* is concerned. The discussions will be published in this journal, with a short summary of each paper, and later on some of the papers will be published in full. We should like to express our appreciation of the action of the editor of *The British Medical Journal*.

¹ *The Canadian Medical Association Journal*, June, 1935.

Abstracts from Current Medical Literature.

RADIOLOGY.

The Intratracheal Use of Iodized Oil in Intractable Asthma.

R. M. BALYEA, L. EVERETT SEYLER AND H. A. SHOEMAKER (*Radiology*, March, 1935) state that patients suffering from intractable asthma may have asthma from one of two of the following sources or from a combination of both: first, the attack may be caused by oedema of the bronchial tubes, due to contact with or ingestion of the substances to which they are specifically sensitive (the congestion is similar to the oedema of the nasal mucosa of a hay fever patient); second, the asthmatic symptoms may be caused by mechanical plugging of the bronchioles and filling of the bronchiectatic areas; or the attack may be due to a combination of the two. Iodized oil bronchograms in the usual type of bronchiectasis will show the bronchiectatic area or areas connected with a fair-sized bronchus or bronchi, while in asthmatic bronchiectasis the bronchiectatic sacs are usually small and located at the end of the bronchioles. They are usually multiple and are often located in one section of the bronchial tree, but they may be scattered throughout a large area. Many cases show a combination of the sacular and tubular forms. Since the sacs of the usual form of bronchiectasis are connected with a fair-sized bronchus or bronchi, postural drainage should be, and is, of value in relieving the patient of purulent sputum. On the other hand, since in asthmatic bronchiectasis of the sacular type the pockets are usually connected with small bronchioles, or the dilated branches in the case of the tubular type are larger than the stem, it would be almost impossible for the thick purulent mucus to drain through the small tubes when postural drainage is attempted. In asthmatic bronchiectasis of either the tubular or the sacular type postural drainage is not only not indicated but is contraindicated. The oil is introduced by means of a syringe fitted with a curved laryngeal cannula after spraying the throat with 2% to 4% cocaine hydrochloride. For bronchograms, 15 to 20 cubic centimetres of iodized oil should be put in on each side. For therapeutic purposes, from 5 to 10 cubic centimetres should be given at weekly, biweekly, or monthly intervals. Of the 50 cases of intractable asthma in which poor results had been obtained by allergic management, very good or good results were obtained in 70% by combining the use of iodized oil intratracheally with allergic management. The efficacy of the intratracheal use of iodized oil lies: (i) in the mechanical coating over the bronchial mucosa of the pendent tubes, preventing contact with

the allergenic substances; (ii) in lubricating the bronchial tubes, thereby preventing plugging; (iii) in replacing the purulent material in the bronchiectatic areas so as to prevent the absorption of toxins. After the oil is brought up, swallowed, saponified, absorbed, and lipodieresis takes place, it is partially eliminated by the bronchial tubes, giving an effect similar to the use of iodides by mouth. In the treatment of intractable asthma, eliminative measures and desensitization against the substances to which the patient is specifically sensitive are of first importance. The intratracheal use of iodized oil in the bronchial tubes is next in importance. A combination of the specific and the mechanical is ideal treatment in cases of intractable asthma. The intratracheal use of iodized oil cannot in itself cure a patient suffering from allergic asthma, but it is of inestimable value as a means of forcing up bronchial plugs and replacing pockets of pus with a non-irritating, non-toxic substance.

Suppuration in the Pneumatic Petrous Apex.

HENRY K. TAYLOR (*American Journal of Roentgenology*, June, 1935) states that the structure of the petrous portion of the temporal bone can be recognized on the skiagram. Routine X ray examinations reveal a high percentage of cases with pneumatic petrous pyramids. Completely pneumatized petrous pyramids are usually associated with large and extensively pneumatized mastoid processes. Suppuration in the petrous apex may occur in any type structure of bone. If the petrous pyramid is composed of diploic bone, an osteomyelitis results. When pneumatization is present, changes result which are analogous to a suppurative lesion in a pneumatized mastoid process—a coalescent petrositis or an empyema of the petrous apex. Röntgenologically the pneumatic petrous pyramid shows a change from the normal with any otitic infection. The petrous pyramid shows a generalized diminution in aeration in every case of acute purulent *otitis media*. The trabeculae appear thickened and are intact. There are no destructive changes. There is no atrophy. The apical contour is distinctly visualized and is intact. This accompaniment to an acute *otitis media* is not due to a suppurative lesion in the petrous pyramid. The diminution in aeration of the petrous pyramid is due to a congestion and oedema of the mucous membrane lining the air spaces. The mastoid process is the site of a similar change in aeration at the same time. In acute coalescent mastoiditis the findings are essentially the same as those found with an acute *otitis media*, but they are more pronounced. In chronic suppurative *otitis media* the petrous pyramid shows a generalized diminution in aeration where a pneumatic petrosa is found. In cases

of suppuration in the petrous apex the petrous pyramid shows a diminution in aeration with an increase in density in the basal or labyrinthine portion. The apical portion of the petrous pyramid shows a definite decrease in density. There is marked decalcification of the entire petrous apex. The trabeculae may show evidences of softening or destruction, these changes becoming more pronounced as the lesion progresses. The halisteresis may be so intense that the apical contour is either faintly visualized or not visualized at all. The fact that the contour of the petrous apex is not visualized does not indicate apical perforation. As the lesion progresses, perforation and destruction of the apex may ensue. It is important to remember that only those changes in skiagrams are to be considered as diagnostic which point to a destructive lesion. Changes in density or diminished aeration are not indicative of a suppurative process in the petrosa. When the mastoid cells are being examined, a film should always be taken of the base of the skull. Should a subsequent lesion develop in the petrous pyramid, this film will be of great value for comparison to detect the changes.

Mucocele of the Frontal Sinus.

ADOLPH HARTUNG AND THEODORE WACHOWSKI (*American Journal of Roentgenology*, July, 1935) state that a mucocele is an accumulation and retention of a mucous secretion within a nasal accessory sinus, usually associated with distension of one or more of its walls. The usual causative factors are obstruction of the naso-frontal duct or enlargement of a retention cyst. It occurs at any age. History of trauma is often elicited. Early symptoms are varied, but later findings of a slow-growing, non-tender tumour in the medial third of the upper part of the eye, with displacement of the globe forward, downwards, and laterally, are characteristic. The majority of the cases show bone distension. In these distended areas the lining membrane has not the shaggy polypoid appearance found in the routine sinus exenteration, but is smooth and more or less atrophic. On section, however, it shows evidence of an inflammatory reaction. This phase follows the inflammatory phase and is probably an atrophy due to pressure. The bony walls show a rarefactive type of osteitis on the side toward the distending fluid and usually exhibit proliferative changes in the periosteum away from the sinus. The X ray findings parallel the pathological picture. The changes depend upon the size, shape and location of the mucocele and the extent to which it has produced pressure effects in the form of erosion, displacement or reactionary changes in the surrounding structures. In those cases without bone erosion, the positive findings are limited to the cases which arise from a retention cyst. A normal sinus contour is present, inside of

which is seen a localized shadow of slightly increased density with smooth rounded outlines. The size is variable. The remainder of the sinus shows normal or increased density. When the distending fluid has begun to cause bone changes, the X ray findings are quite characteristic. The gross outline is usually slightly larger than that of the other side, and there is decreased density over the sinus. The borders lose their septate or scalloped appearance, and the marginal densities become rarefied, smooth and regular, which is perhaps the most characteristic finding. If the distension is rapid, the border may show roughening and areas of bone deficiency. The orbital roof may be flattened and pushed down, and a defect may be seen in it. The ethmoidal cells may be encroached upon. A lateral exposure may reveal considerable unsuspected encroachment upon the anterior cranial fossa. If the process is very slow there may be areas of increased density along the margins or superimposed upon the cavity of the sinus, which represent reactionary bone formation. These shadows may be so dense as to bring up the question of a concomitant osteoma.

PHYSICAL THERAPY.

Uterine Cancer and the Stockholm Method of Treatment.

J. HEYMAN (*Acta Radiologica*, March, 1935) records that for about twenty years the Radiumhemmet gynecologists have followed a uniform method of treatment and that this method has up to date been practised in three thousand cases of uterine cancer. In treatment of cancer of the cervix the ordinary routine method is to place forty milligrammes of radium in the uterus for twenty hours and seventy milligrammes in the vagina for a similar period. At an interval of one week a second course similar to the first is given, and after another three weeks the radium is again applied. The total dose thus given amounts to 2,400 milligramme-hours in the uterus and 4,500 milligramme-hours in the vagina. The filter used for all the applicators is equivalent to three millimetres of lead. Since 1929 they have given Röntgen radiation in all cases of cervical cancer three weeks after the last radium treatment. During recent years they have more and more combined brachyradium with telerradium treatment. In March, 1929, the Radiumhemmet acquired its first large "bomb", containing three grammes of radium, and in February, 1934, a larger one of five grammes. It is still too early to estimate whether this addition to the therapy will improve the five-year results. In treatment of cancer of the body of the uterus it is stated that the less satisfactory results obtained in many places are not ascribable to the histological type, but to an imperfect

treatment technique. The dose distributed in two treatments varies between 2,600 and 4,000 milligramme-hours, according to the size of the uterus. The quantity varies between 80 and 200 milligrammes. Because of the danger of later metastasis to the vagina they give at least one vaginal treatment in all fundus cases. After the treatment is concluded the patient is carefully controlled by regular examinations. If symptoms do not disappear or if new symptoms, such as bleeding, discharge or an increase in the size of the uterus, reappear after a temporary cure, a total hysterectomy is done. Biopsies are performed at the first treatment in all cases. Excochleation of the tumour is never done. Anaesthesia is usually unnecessary. The patients are in hospital as a rule for four days during each brachyradium treatment. Between treatments the patient is generally up and about and able to do her housework. Severe radium injuries, such as fistula of the bladder and rectum, scarcely ever occur. Mild proctitis cannot be entirely avoided. Ulceration of the bladder is occasionally observed. It may appear several years after treatment, and as a rule causes only insignificant discomfort. Perforation of the uterus occurs, but requires no special interference. Severe salpingitis, diffuse peritonitis and pulmonary embolism are the really dangerous complications. Their primary mortality lies between 1% and 2%. The author describes five-year cure results in cancer of the cervix from 1914 to 1928 inclusive. The absolute cure rate in 1,537 cases observed was 21.3%. The relative cure rate among 1,455 primarily radiologically treated patients was 22.5%. The relative cure rate in Stages I, II, III and IV was 57.3%, 34.3%, 16.2% and 5.3% respectively.

Carcinoma of the Uterine Cervix Treated by Irradiation.

ROBERT E. FRICKE (*The American Journal of Roentgenology and Radium Therapy*, May, 1935) states that an examination was made of the findings at necropsy of patients who died of carcinoma of the uterine cervix at the Mayo Clinic during a ten-year period, from 1924 to 1933 inclusive. Of the 1,117 patients who were treated by radium and X rays, thirteen died during the primary course of treatment. Comparison of findings at necropsy of patients who died during the first course of treatment and of those who died during subsequent visits disclosed that acute pelvic infection and hemolytic streptococcal septicæmia accounted for most of the deaths in the first group. There were, however, as many patients with metastasis to the lymph glands in the first group as in the second, and there was a greater number with distant metastasis in the first group than in the second. Distant metastasis occurred mainly to the lungs and to the liver. The deduction made from analysis of this group of patients

who died during treatment by irradiation are threefold: (i) The prognosis in every case accepted for treatment must be very guarded. The possibility of a serious complication must always be kept in mind. (ii) The best method of keeping the mortality rate as low as possible is by thorough study of each individual case and, with suspicion of metastatic involvement or of impaired renal function, to limit treatments so as not to place undue stress on the patient. Such patients should be treated for palliation rather than for cure. (iii) The broken-dose method of treatment seems preferable to the massive dose technique; the effect appears to be gentler and more gradual and, on the appearance of any serious complication, irradiation may be instantly abandoned. By careful nursing and supportive measures many of these unfortunate patients may be saved.

The Effect of X Ray Therapy upon Tumours of the Kidney.

ALBERT E. BOTHE (*The American Journal of Roentgenology and Radium Therapy*, April, 1935) states that the pathological findings indicate that all kidney tumours should have X ray treatment before surgical removal and that this irradiation should include the whole body. By the pathological findings he means that all kidney tumours are very often mainly embryonal, of poorly differentiated cells, and therefore radio-sensitive. He states here that all patients of bad general condition, for example, anæmic and cachectic, do badly with irradiation treatment. Mixed tumours of the kidney are stated to be the most radio-sensitive, because of their sarcomatous elements; it is the epithelial cells in these tumours that resist irradiation; the result therefore seems to depend on the proportion of embryonal tissue present. The author maintains that surgical procrastination following irradiation results in early recurrence and metastasis. He states that the operation should take place between the sixth and twelfth weeks.

Röntgen Therapy in Syringomyelia.

FREDERICK W. O'BRIEN AND P. F. BUTLER (*Radiology*, January, 1935) state that symptomatic relief has followed X radiation in the majority of a group of thirty cases of syringomyelia. They employed a high voltage X ray quarter skin dose daily and repeated it at an interval of one to three months. All patients were examined and the diagnosis was made by the neurological officers of the hospital. The authors assert that the nature of the improvement has been unmistakable, such as return of thermal sensation, cessation of pain, restitution of voluntary muscular movement *et cetera*. How this action takes place is more than problematical and some theories are given. The authors have found the skin of these patients more sensitive to X rays than is the skin of normal individuals.

British Medical Association News.

MEETING OF THE FEDERAL COUNCIL.

A MEETING OF THE FEDERAL COUNCIL OF THE BRITISH MEDICAL ASSOCIATION IN AUSTRALIA was held at the Medical Society Hall, East Melbourne, on September 7, 1935, SIR HENRY NEWLAND, the President, in the chair.

Representatives.

The following representatives of the Branches were present:

New South Wales: Dr. George Bell, O.B.E., Dr. A. M. Davidson, O.B.E. (as substitute for Dr. J. Adam Dick).
Queensland: Dr. D. Gifford Croll, C.B.E., Dr. T. A. Price.
South Australia: Sir Henry Newland, C.B.E., D.S.O., Dr. Bronte Smeaton.
Tasmania: Dr. A. W. Shugg, Dr. S. Gibson.
Victoria: Dr. J. Newman Morris, Dr. F. L. Davies.
Western Australia: Dr. D. D. Paton, Dr. D. M. McWhae, C.M.G.

Minutes.

The minutes of the previous meeting of the Federal Council on February 28 and March 1, 1935, were read and signed as correct.

Resignation of Dr. E. S. Meyers.

It was noted that Dr. E. S. Meyers, of the Queensland Branch, had resigned his membership of the Federal Council and that Dr. T. A. Price had been appointed in his place. Reference was made to the many years of service that Dr. Meyers had given to the Council, and it was resolved that a letter of appreciation should be written to Dr. Meyers.

Finance.

The financial statements and balance sheets for the six months ending on June 30, 1935, and the twelve months ending on June 30, 1935, of the Federal Council Fund and of the Australasian Medical Congress (British Medical Association) Fund were presented by Dr. George Bell and received.

The Honorary Treasurer reported that the *per capita* payment of two shillings had been made by the Branches for the year 1935. He estimated that the funds in hand would be sufficient to meet the expenditure of the next six months. It was therefore resolved that the question of asking for further payments from the Branches should be allowed to stand over till the next meeting.

The President informed members that on the arrival of officials of the Parent Body, who would be attending the annual meeting of the Association, a conference on financial matters would be held between the officials of the Parent Body and the Federal Council.

Medical Officers' Relief Fund (Federal).

On behalf of the Trustees of the Medical Officers' Relief Fund (Federal), Dr. George Bell presented a report for the year ended June 30, 1935. It was stated that the Trustees had found it necessary to institute legal proceedings against one of the debtors and that a judgement in favour of the Trustees had been obtained. Another debtor had ignored all correspondence in regard to his loan, and the Trustees thought that in this instance it might be necessary to institute proceedings.

Handbook for Legally Qualified Practitioners.

The Secretary reported that the New South Wales Branch had forwarded a copy of a recently issued handbook for legally qualified medical practitioners. This book had been issued by the Branch Council to all the members of the Branch.

Dr. J. Newman Morris said that he thought that the New South Wales Branch should be congratulated on the production of the book. He thought that it contained information that was likely to be extremely useful to members, and he hoped that in time it would form the basis for an Australian book that would be issued by the Federal Council for the use of all the Branches.

Australian Association of Anaesthetists.

A letter was read from the Secretary of the Australian Association of Anaesthetists, announcing the holding of its annual meeting from September 16 to 18, 1935.

British Social Hygiene Council.

The Secretary announced that a letter had been received from the British Social Hygiene Council, requesting the Federal Council to nominate a delegate to represent the Federal Council at the 1935 congress of the British Social Hygiene Council, to be held in Great Britain. As the matter had been one of urgency, the President had asked Dr. L. C. E. Lindon, of Adelaide, who would be in England, to act as delegate. Dr. Lindon had consented.

Australian Representatives on the Council of the Parent Body.

Letters were received from Sir Thomas Dunhill and Professor R. J. A. Berry, the representatives of the Australian Branches on the Council of the Parent Body, expressing their appreciation of the receipt of the minutes of the Federal Council meetings.

The Late Sir Richard Stawell.

A communication was read from the Victorian Branch regarding a memorial to the late Sir Richard Rawdon Stawell. Reference was made to the work of Richard Rawdon Stawell, particularly in regard to the formation of the Federal Committee—he had been one of those who helped to bring the Federal Committee into being. The Council passed a resolution expressing appreciation of his life of service for the profession and the public, and regret at his untimely death.

The Sixth Australian Cancer Conference.

Dr. J. Newman Morris reported that he had acted as representative of the Federal Council at the Sixth Australian Cancer Conference. He said that the chairman of the conference, Dr. J. H. L. Cumpston, had drawn attention to the fact that the Federal Council had been represented for the first time at the Sixth Session and expressed his appreciation of the fact. Dr. Morris pointed out that the Australian Cancer Conference had originated after the purchase by the Commonwealth Government of a quantity of radium for use in cancer treatment throughout Australia. The personnel of the conference was in the first place composed largely of radiotherapists, physicists, research workers and representatives of anti-cancer committees. The conference had, however, included more and more clinical work, and its transactions contained resolutions that affected the general body of the medical profession. The resolutions of the Sixth Conference illustrated this increasing tendency, and Dr. Morris directed the attention of members of the Federal Council to these resolutions as they appeared in the official report of the conference. These resolutions referred *inter alia* to such matters as medical education in cancer treatment, diagnosis, hospital records, certification of death and post-graduate teaching. These matters not only affected the general medical profession directly, but they might also become the subject of amending legislation. Apart from purely technical and specialist aspects relative to radium and radiotherapy, subjects discussed at the Sixth Conference included the treatment of cancer of the breast and the place of the general practitioner in a national organization against cancer.

Dr. Morris went on to say that it became apparent to him that the British Medical Association should be actively associated with a body which discussed matters so clearly affecting its members, and which included many

persons who were not members of the Association and who were not medical practitioners. The Director-General of Health, in his opening remarks, had particularly welcomed the definite cooperation of the British Medical Association and the Royal Australasian College of Surgeons; he had expressed the view that progress in attaining the objects of the conference was possible only in proportion to the degree of cooperation that the British Medical Association and the Royal Australasian College of Surgeons were in a position to give. This cooperation constituted an essential and gratifying forward move.

Dr. Morris had stated that the Federal Council desired to cooperate with the Cancer Conference, and would, if required, assist actively in the development of concerted movement between States for the control of cancer, and also had expressed the opinion that future conferences should be held in close association with the British Medical Association. The Victorian Branch Council had repeatedly expressed its opinion that the conference should be held in larger and more accessible centres and thus be available to more members of the medical profession. Dr. Morris had therefore moved that the Seventh Australian Cancer Conference should be held in Melbourne, and this motion was accepted. An Agenda Committee had been appointed, consisting of several nominated people, together with a representative of the British Medical Association, of the Royal Australasian College of Surgeons, and of interested public bodies. Dr. Morris concluded by drawing attention to the activities of the Commonwealth Government in this and other matters affecting the medical profession, such as maternal mortality and the treatment of cripples. He suggested that it was a matter for consideration by the Federal Council as to whether the Council was sufficiently alert in maintaining and protecting the interests of the medical profession in Australia in these matters.

Dr. Newman Morris's report was received and adopted. It was decided to write to Dr. M. J. Holmes, of the Commonwealth Department of Health, and to inquire regarding the appointment of an official representative from the Federal Council to the Agenda Committee.

Australian Medical Directory.

A communication was received from the Queensland Branch requesting that stricter supervision should be exercised in the compilation of the Australian Medical Directory. The Branch felt that in several instances too much detail had been given regarding the careers of some members of the medical profession. After discussion it was resolved, on the motion of Dr. A. W. Shugg, seconded by Dr. D. D. Paton, that no action should be taken.

The Nuffield Trust for Crippled Children.

The Secretary reported that a request had been received for the appointment of a representative to the Nuffield Trust for Crippled Children. The matter had been one of urgency and he had communicated with the President, Sir Henry Newland. The President had nominated Dr. R. B. Wade, of Sydney. The Council approved the nomination.

Orthoptic Treatment by Lay Practitioners.

The question of orthoptic treatment of strabismus by lay practitioners was raised at the instance of the Victorian and the Western Australian Branches. It was stated that broadcast talks had been given on the subject and that orthoptic treatment was being advised and undertaken when it was unnecessary. As this matter was concerned with broadcast health talks generally, consideration was deferred until later on in the meeting.

Commonwealth Employees' Compensation Act.

A letter was read from the Victorian Branch regarding the Commonwealth *Employees' Compensation Act*. From this it was evident that Victorian medical practitioners were not aware that they were entitled to payment for their services under this Act. The Secretary was asked to prepare a statement for transmission to the Branch Councils.

The One Hundred and Third Meeting of the Association.

It was noted that Dr. C. M. Murray had been appointed the official delegate from the Medical Association of South Africa to attend the one hundred and third annual meeting of the British Medical Association in Melbourne.

Annual Report of the Federal Council.

A draft annual report of the Federal Council for the twelve months ended June 30, 1935, was submitted and approved.

Annual Subscription of Members in Australia.

In regard to the annual subscription of members of the Association in Australia payable to the Parent Body, it was noted that on Tuesday, September 10, 1935, a conference would be held between officials of the Home Association and the Federal Council. At this conference the financial relationship would be fully discussed.

Australasian Medical Congress (British Medical Association).

The Fourth Session.

The Executive Committee of the Fourth Session of the Australasian Medical Congress (British Medical Association), held in Hobart in January, 1934, forwarded a report embodying suggestions for the conduct of future congresses. This report was received and was forwarded for consideration to the sub-committee appointed by the last meeting of the Federal Council to consider congress procedure.

The Fifth Session.

It was resolved, on the motion of Dr. J. Newman Morris, seconded by Dr. George Bell, that the Fifth Session of Congress should be held in Adelaide towards the end of August, 1937.

The Publicity Committee.

At the previous meeting of the Federal Committee the Secretary of the Federal Council and the Editor of THE MEDICAL JOURNAL OF AUSTRALIA were appointed a sub-committee to report on the formation of a publicity committee in connexion with each session of congress. The subcommittee reported that the matter of publicity was one that could best be handled by a small committee, preferably of two, constituted as follows: (i) a member of the Ethical Committee of the Branch in the area of which the Congress was being held, (ii) the General Secretary of the Federal Council. It was stated that, owing to their Congress duties, it would not be possible for the Editor of THE MEDICAL JOURNAL OF AUSTRALIA or for the Honorary Secretaries of Congress to act on the committee. The Secretary of the Federal Council would, however, have no official Congress duties to perform and would almost certainly be present.

The Formation of Special Associations Within the Profession.

At its previous meeting the Federal Council considered the report of a subcommittee which had been appointed to inquire into the formation of special associations within the profession. The report of the subcommittee dealt with: (a) the desirability of such movements, (b) their limitations, (c) model conditions to keep such movements within the ambit of the British Medical Association. At the previous meeting of the Council it was resolved that the report of the subcommittee should be forwarded to the Branches for their consideration. The South Australian Branch had replied, leaving the matter in the hands of its delegates. The Western Australian Branch agreed with the report, but thought that the danger to the Association was exaggerated. It thought that members of outside associations should be members of the British Medical Association. The Tasmanian Branch supported the recommendations of the subcommittee and expressed the opinion that other associations should not hold their meetings at a time that would be likely to interfere with

the attendance at sessions of the Australasian Medical Congress. The Queensland Branch approved of the report. The Victorian Branch expressed the opinion that associations formed without the ambit of the British Medical Association should confine their activities to scientific work. It approved of the formation of model rules to govern such bodies and thought that in matters affecting the relationship of the medical profession to governments or to the public the British Medical Association alone should be the medium of approach. The New South Wales Branch thought that membership of the British Medical Association should be essential to membership of other associations.

Dr. J. Newman Morris thought that a committee should be formed to draw up model rules for the formation of sections of the British Medical Association. He pointed out that this was a matter which affected the Parent Body, for, according to the rules of the British Medical Association, any member could join any section if he so desired, and the members of the Section had no powers of refusal. He thought that specialist members of a section should be able to meet without having amongst their number persons who did not belong to the specialty. In Great Britain steps had been taken to define the members of a specialty, and members of special sections should be confined to those who came within the definition. Dr. Morris thought that there was danger of disintegration of the British Medical Association if the present situation was allowed to continue.

Dr. F. L. Davies pointed out that outside associations frequently took advantage of British Medical Association facilities to hold their meetings.

Sir Henry Newland expressed the opinion that sections of the British Medical Association should have power to elect their own members. He stated that the Royal Australasian College of Surgeons would never have been formed had this provision been in existence.

It was resolved that this matter should be discussed with the officials of the Parent Body at the conference on the following Tuesday.

Therapeutic Investigation Bureau.

At its previous meeting the Federal Council considered a proposal from the Pharmaceutical Association of Australia and New Zealand regarding the proposed formation of a therapeutic investigation bureau. At that time the matter was referred to the Branches. Several of the Branches had replied approving of the principles. Dr. D. M. McWhae thought that the legal position should be investigated. It was resolved that the subcommittee consisting of Dr. J. Newman Morris and Dr. F. L. Davies should continue its investigations and report progress at the next meeting of the Federal Council.

Broadcasting Health Talks.

Further consideration was given to the control of the broadcasting of health talks throughout the Commonwealth. The Secretary reported that the Minister of Health for the Commonwealth had been approached on the matter and that he had replied asking for specific instances in which harm had been done. Dr. George Bell pointed out that the matter was one for the Minister and that it would be necessary to make repeated representations to him. It was resolved that a further letter should be written to the Minister and that his attention should be drawn to the position that had arisen in Western Australia in regard to orthoptic treatment of strabismus.

Medical Research Work at Canberra.

At the previous meeting of the Federal Council, Dr. J. H. L. Cumpston, Director-General of Health, Commonwealth Department of Health, and Sir Colin MacKenzie, of the Institute of Anatomy, Canberra, addressed the Federal Council at the request of the Acting Prime Minister of the Commonwealth, Dr. Earle Page, in regard to research work that it was proposed to carry out at Canberra. After these addresses had been given at its last meeting, the

Federal Council wrote to the Acting Prime Minister recommending the formation of a medical research council as proposed by the Royal Commission on Health in its report of 1925. The Secretary reported that no reply had been received by the Federal Council. It was pointed out that the matter had been raised by the Acting Prime Minister and not by the Federal Council, and it was resolved that a further letter be sent asking for a reply to the Federal Council's first communication. In the proposed letter it was to be stated that the Federal Council had been given to understand that the matter was one of urgency.

The Australian Army Medical Corps.

At its previous meeting the Federal Council considered the proposal that an officer of the Australian Army Medical Corps should visit England in his military capacity, in order that he might study the latest developments connected with army medical service. The Secretary reported that he had written to the Minister for Defence on the matter and that he had received a reply in which the Minister stated that he had considered the position, that he agreed with the views expressed, that no funds were available, but that the matter would be borne in mind. It was resolved that a further letter should be written to the Minister and that he should be urged to have the matter placed on the estimates.

The Australian Naval Medical Services.

Further reference was made to the conditions of service for medical officers with the Royal Australian Navy. At its previous meeting the Federal Council appointed a subcommittee to continue investigation on the subject. The Council had before it a tabulated statement of the rates of pay of the several ranks in the Naval Medical Service in the Royal Navy and in the Royal Australian Navy. Some alterations had recently been made. As a result of these alterations some gains had been made and some officers, particularly in the lower grades, had suffered a slight loss. The position of the several ranks was discussed in detail, and it was resolved that a further letter should be written to the Minister drawing his attention to the most glaring of the anomalies.

The Importation of Resident Medical Officers from England.

A letter was received from the Tasmanian Branch drawing attention to a proposal to import resident medical officers from England. The Secretary said that the matter had been sent to the Branches for their consideration and that replies had been received. It was stated that a difficulty was being experienced in many centres in finding suitable medical officers to fill vacant positions as they arose. In some instances medical officers had been unobtainable and students were doing the work of qualified graduates. Dr. F. L. Davies expressed the opinion that resident medical officers were not sufficiently well paid. Dr. D. G. Croll said that the work of a resident medical officer was not made sufficiently attractive for him. He thought that if resident officers were charged with a certain amount of responsibility there would be no difficulty in obtaining them. Dr. J. Newman Morris did not agree that the salary paid to resident medical officers was any more than an honorarium. He said that there was a shortage of graduates, but that in a year or two the position would right itself. Dr. D. D. Paton explained how the difficulty had been surmounted in Perth. He said that the trouble arose largely because resident medical officers were required to spend many hours in giving anaesthetics when they should be engaged in ward duties. The position had been explained to medical practitioners in Perth; they had been told that it might be necessary to bring men from overseas to fill the positions. The result was that practitioners gave their services for so many hours a week as anaesthetists and that the resident medical officers were free to carry out other necessary work. It was finally resolved that a letter should be written to the Branch Council stating that, in the opinion of the Federal Council, the shortage was temporary and that some effort

should be made to make the work of resident medical officers more attractive by giving them a proper amount of responsibility.

Treatment of Members of the Permanent Military Forces.

At the instance of the Victorian Branch, consideration was given to the treatment of members of the Permanent Military Forces in public hospitals. It was pointed out that the Defence Department guaranteed the medical treatment of members of the Permanent Military Force and that this treatment was being obtained in hospitals from honorary officers. From the discussion it was apparent that the Department was adopting a different practice in several of the States. The discussion centred round an incident that had occurred in one of the larger Victorian towns, and it was resolved, on the motion of Dr. J. Newman Morris, seconded by Dr. A. W. Shugg, that the whole matter should be brought to the notice of the Minister for Defence. The board of the hospital in the Victorian town concerned was also to be written to, that it might be made cognizant of the views of the Federal Council.

Newspaper Publicity and the Meeting of the Australian and New Zealand Association for the Advancement of Science.

At its last meeting the Federal Council considered the undue publicity given by newspapers to papers read at the medical section of the Australian and New Zealand Association for the Advancement of Science at its meeting held in Melbourne in January, 1935. The Secretary of the Federal Council reported that he had interviewed the Secretary of the Australian and New Zealand Association for the Advancement of Science. He had been informed that the main difficulty was that certain newspaper men were also members of the association in question. It was hoped that in future greater control would be exercised.

A Hospital Policy for Australia.

The Honorary Local Secretary of the one hundred and third annual meeting of the Association wrote regarding the question of arranging a meeting of representatives of the Branches to discuss hospital problems during the course of the annual meeting. It was noted that a morning was to be given to the discussion of national insurance. Since the question of a hospital policy was largely bound up with national insurance, it was decided to make no special move in the matter.

National Health Insurance for Australia.

At its previous meeting the Federal Council appointed Sir Henry Newland, Dr. J. Newman Morris and Dr. Bronte Smeaton a subcommittee to report on the subject of national health insurance for Australia. The subcommittee presented its report, which was received and adopted.

Time and Place of the Next Meeting.

The determination of the time and place of the next meeting was left in the hands of the President.

Votes of Thanks.

Votes of thanks were recorded to the Council of the Victorian Branch for having provided accommodation for the meeting and for its hospitality, and to Sir Henry Newland for having presided.

NOMINATIONS AND ELECTIONS.

The undermentioned have been elected members of the Victorian Branch of the British Medical Association:

- Bolton, John Henderson, M.B., B.S., 1932 (Univ. Melbourne), Melbourne Hospital, Melbourne, C.I.
O'Brien, Edward Donough Ernest Eugene, M.B., B.S., 1931 (Univ. Melbourne), 34, Mitford Street, Elwood, S.3.
Richards, Alan William, M.B., B.S., 1934 (Univ. Melbourne), Melbourne Hospital, Melbourne, C.I.

- Kirsner, Lazer, M.B., B.S., 1931 (Univ. Melbourne), 2, Hepburn Street, Hawthorn, E.2.
Abrahams, Elsie Louisa, M.B., B.S., 1934 (Univ. Melbourne), 8, Cambernere Street, Essendon, W.5.
Hutson, Andrew William Medwyn, M.B., B.S., 1934 (Univ. Melbourne), Melbourne Hospital, Melbourne, C.I.
Duncan, Campbell Amiet, M.B., B.S., 1933 (Univ. Melbourne), 20, Lower Heidelberg Road, Ivanhoe.
Laurie, Henry William Spalding, M.B., B.S., 1933 (Univ. Melbourne), Sefton Place, East Camberwell, E.6.
Callander, Robert Scott, M.B. et Ch.B., 1908 (Univ. Melbourne), 248, Queen's Parade, North Fitzroy.
Bell, Mary Anketell, M.B., 1906 (Univ. Melbourne), 7, Berkeley Street, Hawthorn, E.2.
Hutchings, Margaret, M.B., 1906 (Univ. Melbourne), 43, Kooyong Road, Armadale.

Medical Societies.

THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA.

A MEETING OF THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA was held at the University of Adelaide on April 5, 1935.

Scientific Work in Russia.

PROFESSOR J. A. PRESCOTT described his recent visit to Russia and touched briefly on many aspects of the economic position of the scientific worker in that country. He also described some of the work he had seen, and stated that in animal investigation in Russia the work had developed almost entirely in the field of animal breeding.

Vitamin A Deficiency.

DR. E. McLAUGHLIN described and illustrated by photographs a case of what he regarded as one of vitamin A deficiency associated with achlorhydria. The skin condition illustrated closely resembled the picture described by Lowenthal and by Frazier and Ch'uan-K'uei Hu and was found in association with cases which displayed night-blindness and keratomalacia. The condition in the patient described rapidly disappeared after the assumption of a normal diet was permitted by the administration of dilute hydrochloric acid.

Dr. McLaughlin said that he believed that evidence of minor degrees of vitamin deficiencies was not uncommon in persons taking a normal mixed diet, and they depended upon defective absorption from the alimentary tract and were frequently associated with achlorhydria or hypochlorhydria. Some experiments were now being carried out on persons with "atrophic tongues" and on others with hyperkeratosis of the vulva, and he hoped the results would be ready for publication at a near date.

A MEETING OF THE MEDICAL SCIENCES CLUB OF SOUTH AUSTRALIA was held at the University of Adelaide on July 5, 1935.

Referred Pain.

PROFESSOR H. J. WILKINSON said that certain observations and experiments suggested a new explanation of the mechanism of referred pain. He reviewed the current views of Mackenzie (symptoms and their interpretation) and of Morley (abdominal pain) and found that they offered inadequate explanation of all the phenomena associated with referred pain. Professor Wilkinson described reflex autonomic phenomena in those somatic areas supplied by the same segments of the cerebro-spinal axis as were the viscera concerned. Among these were

an alteration in temperature, indicating reflex vasomotor effects. This suggested that the pain was really somatic in origin and secondary to visceral disturbances. This was further substantiated by the fact that local anaesthesia of the somatic areas abolished the so-called referred pain and reflex rigidity. No theory of peritoneo-cutaneous radiation (Morley) or of overflow from visceral afferent pathways to pain pathways in the cord (Mackenzie) could account for the abolition of referred pain by local anaesthesia. Further observations and experiments were being made, and shortly a more detailed account would be submitted.

Obituary.

PATRICK JOHN COLLINS.

DR. PATRICK JOHN COLLINS, whose death was recorded recently in these pages, was born at Trim, County Meath, Ireland. He studied medicine in Dublin and became a Licentiate of the Royal College of Surgeons of Ireland and of the King and Queen's College of Physicians of Ireland. He held resident posts at Coombe Hospital and Jervis Street Hospital, Dublin. Subsequently he practised for two years in London and then spent two years as ship's surgeon in the Cunard Line. In 1882 he came to Adelaide, where he remained for four years. After this he removed to Woollahra. Woollahra was his home until he died; he built up an extensive practice and was by common consent regarded by his brother practitioners in the district as their leader. Suburban practice can be pleasant or unpleasant. It can be made pleasant by a recognition of the common aims of practitioners and by their coming into contact with one another apart from work at the bedside. Collins was respected by his *confrères* for his understanding and kindness and for the zeal with which he pursued the interests of the Eastern Suburbs Medical Association. At a recent meeting of that body most cordial and appreciative reference was made to him and he was elected an honorary life member. His wise counsel will be missed by those, and they were not few, who so often sought it. During the War Collins was attached to the military hospital at Randwick with the honorary rank of Major, and did valuable work. He served for a period as honorary physician on the staff of Saint Vincent's Hospital. For many years he was a member of the Council of the Medical Union of New South Wales. He was for upwards of fifty years a member of the New South Wales Branch of the British Medical Association.

Dr. J. Adam Dick writes:

Dr. Patrick John Collins passed away, as reported in a previous issue, on July 28, 1935, at his home at Woollahra, after a brief illness, a victim to the recent epidemic of influenza and pneumonia. For many years he carried on an extensive practice in Woollahra, one of the populous and fashionable suburbs of Sydney. In a circle far beyond the bounds of his own large practice he came to be the confidant of those in trouble and there must be many in all classes who feel with his passing the loss of a very real friend. In his practice he never spared himself, but always had the welfare of his patients at heart. His genial and kind personality will long remain as a happy memory with a large number of his patients and friends by whom he will be greatly missed.

Apart from his practice, Dr. Collins took an active part in medical organizations and became a member of the New South Wales Branch of the British Medical Association early after his registration in New South

Wales in 1884. In September, 1890, he became one of the founders of the Eastern Suburbs Medical Association of Sydney, and in 1892 became its second President, and after a membership of many years he was elected in 1935 the first honorary member of that Association, a distinction which pleased him greatly. Dr. Collins was an early member of the New South Wales Medical Defence Union and served for a great many years on the council of that Union, and was still a Councillor at the time of his death.

Genial in manner, kind in heart, sagacious in his judgements and far-seeing in his perception, he retained his vigour of body and mind through more than the usual span of years, and he was able throughout the long period of a working life to fulfil his numerous engagements. Few men have been more widely loved and none could deserve that love more unreservedly. It may be truly said of him, he was a born doctor. Our heartfelt

sympathy goes out to his widow, sons and daughters.

Correspondence.

ETHYL CHLORIDE IN ANÆSTHESIA.

SIR: In the recent correspondence on the induction of anaesthesia by ethyl chloride and ether, only the method of using these products in sequence has been referred to. There is an alternative method worthy of mention, which,



in my hands at least, during the last ten years, has given better results. I refer to the concurrent use of these two anaesthetics on the same mask.

Ethyl chloride is always administered by drops, a wisp of cotton wool being inserted under the cock. It is easier to gauge the amount given and to regulate the flow by this method than by using the full jet.

Induction is commenced in this manner by using ethyl chloride or "Borone" by itself for ten to fifteen seconds; at this stage ether is commenced in very small amounts. Sometimes the patient is conscious of this addition; mostly he is not. The former represents an error in timing, though rarely, if ever, produces any other effect than its recognition by the patient. Both ethyl chloride and ether are now given in gradually increasing strength. The third stage of ethyl chloride anaesthesia need not be aimed at—it is immaterial. At or before this stage the strength of ethyl chloride is gradually lessened, a maintenance quantity alone being required, whilst the ether is increased in the usual way and finally administered alone. This method is pleasant for the patient, time-saving, and, above all, produces a smooth induction, devoid of struggling, spasm of the glottis or coughing. I have had no occasion to doubt its safety.

Dr. Lidwill (THE MEDICAL JOURNAL OF AUSTRALIA, August 31, 1935) informs us that "the anaesthesia from ethyl chloride continues to deepen for about eighteen seconds after the administration of this drug has been stopped". Used in the quantity he now recommends, this is surprising. Even so, I think most anaesthetists find that patients emerge too quickly from the ethyl chloride influence and are met by a mask wet with ether in a stage when spasm and coughing are likely to occur. Apparently some of Dr. Storey's anaesthetists have had this experience, and I cannot be surprised at his preference for induction by ether alone.

My ten years' experience of the method I have outlined received considerable support twelve months ago, whilst undergoing an operation in Sydney. So pleasant was my induction that I questioned my friend as to his technique. It was with great interest I learned that his methods coincided with mine. His status as an anaesthetist is such that I require no further confirmation of a method I had already proved to be good.

Yours, etc.,

PHILLIP L. DANIEL.

West Wyalong,
September 5, 1935.

THE TOADSTOOLS AND MUSHROOMS AND OTHER LARGER FUNGI OF SOUTH AUSTRALIA.

SIR: A year ago you were good enough to publish in THE MEDICAL JOURNAL OF AUSTRALIA a letter drawing attention of the medical profession to the publication of a series of "Handbooks on the Flora and Fauna of South Australia", amongst them being "The Toadstools and Mushrooms and Other Larger Fungi", Part I, by Dr. J. B. Cleland, Professor of Pathology in the University of Adelaide.

The second and concluding part of this work has been issued recently and has been favourably reviewed. Amongst the forms specially dealt with are many of those highly destructive to timber, the puffballs, coral fungi, and the myxomycetes. There are numerous keys to the families, genera and species, and abundant illustrations, several of them in colour.

The two parts constitute a work of very great economic importance to Australia and represent the result of studies extending over a quarter of a century. This work, like all others constituting the series of "Handbooks", has been performed gratuitously by the author and has been published by the Government Printer, Adelaide, the price charged being based on the actual cost of production; hence the low cost of such books, each part of the present work being purchasable for 5s.

The Handbooks Committee of the British Science Guild (South Australia) is responsible for the preparation and editing, while the South Australian Government has undertaken the printing of the information so generously made available by the scientific contributors to the series.

Yours, etc.,

T. HARVEY JOHNSTON,
Professor of Zoology and Honorary
Secretary, Handbooks Committee,
British Science Guild (South
Australian Branch).

The University of Adelaide,
September 6, 1935.

WHOOPIING COUGH AND VACCINE TREATMENT.

SIR: Reference my article "Whooping Cough, with Special Reference to Pertussis Vaccine".

I do not agree with Dr. Murray that the four controls are unjustifiable. They were not given the treatment before the onset of complications and therefore are definite controls. In his first letter Dr. Murray appeared as a statistician. In his second he adopts the dual rôle of a scientist who is interested only in facts, and a literary adviser who obviously draws his experience from fiction.

It is all very amusing.

Yours, etc.,

Armadale,
Victoria,
September 15, 1935.

IVAN BLAUBAUM.

Australasian Medical Publishing Company, Limited.

ANNUAL MEETING.

THE annual meeting of the Australasian Medical Publishing Company, Limited, was held at The Printing House, Seamer Street, Glebe, on September 23, 1935, Dr. T. W. Lipscomb, the Chairman, in the chair.

Directors' Report.

The Directors' report was presented as follows.

The Directors submit their report for the past year and the balance sheet as at June 30, 1935, together with the profit and loss account for the twelve months ended June 30, 1935.

THE MEDICAL JOURNAL OF AUSTRALIA retains its position as a scientific publication and maintains its popularity. It has now been published regularly every week for twenty-one years.

A large volume of work is being turned out by the printing and publishing department. For the purpose of providing for additional business it was found necessary to make extensions to the building and to install additional plant.

The result of the transactions of the company for the twelve months is similar to that of the previous year. A small surplus remains after provision is made for debenture interest, and the Directors have pleasure in authorizing the payment in full of debenture interest for the twelve months ended June 30, 1935.

Dr. D. Gifford Croll and Sir Henry S. Newland retire from office by rotation, in accordance with the Articles of Association (Article 39). They are eligible and present themselves for reelection.

T. W. LIPSCOMB,
Chairman.

September 15, 1935.

Election of Directors.

Dr. D. Gifford Croll and Sir Henry S. Newland were reelected to the Board of Directors.

Post-Graduate Work.

LECTURES IN OBSTETRICS.

THE New South Wales Permanent Post-Graduate Committee announces that a course of two lectures in obstetrics will be given at the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, on October 21 and 23, 1935. The lectures will be given by Dr. J. B. Banister, of London. The subjects are as follows: "Prognosis and Treatment of the Toxæmias of Pregnancy" and "The Management of Delayed Labour". The fee for the course will be ten shillings and sixpence (six shillings for a single lecture). Applications for tickets should be made to the Honorary Secretary of the Committee, 225, Macquarie Street, Sydney; or payment may be made at the door.

Diary for the Month.

- OCT. 1.—Tasmanian Branch, B.M.A.: Council.
 OCT. 1.—New South Wales Branch, B.M.A.: Council (quarterly).
 OCT. 2.—Western Australian Branch, B.M.A.: Council.
 OCT. 2.—Victorian Branch, B.M.A.: Branch.
 OCT. 3.—South Australian Branch, B.M.A.: Council.
 OCT. 4.—New South Wales Branch, B.M.A.: Annual Meeting of Delegates of Local Associations of Members with Council.
 OCT. 4.—Queensland Branch, B.M.A.: Branch.
 OCT. 8.—Tasmanian Branch, B.M.A.: Branch.
 OCT. 8.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
 OCT. 11.—Queensland Branch, B.M.A.: Council.
 OCT. 15.—New South Wales Branch, B.M.A.: Ethics Committee.
 OCT. 15.—Tasmanian Branch, B.M.A.: Council.
 OCT. 16.—Western Australian Branch, B.M.A.: Branch.
 OCT. 16.—Victorian Branch, B.M.A.: Clinical Meeting.
 OCT. 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.
 OCT. 23.—Victorian Branch, B.M.A.: Council.
 OCT. 24.—New South Wales Branch, B.M.A.: Clinical Meeting.
 OCT. 25.—Queensland Branch, B.M.A.: Council.
 OCT. 31.—South Australian Branch, B.M.A.: Branch.
 OCT. 31.—New South Wales Branch, B.M.A.: Branch.

Books Received.

- CATECHISM SERIES: MEDICINE: DISEASES OF THE NERVOUS SYSTEM (Part V); Third Edition; 1935. Edinburgh: E. and S. Livingstone. Crown 8vo.
 RECENT ADVANCES IN DISEASES OF CHILDREN, by W. J. Pearson, D.M., F.R.C.P., and W. G. Wyllie, M.D., F.R.C.P.; Third Edition; 1935. London: J. and A. Churchill, Limited. Demy 8vo., pp. 576, with illustrations. Price: 15s. net.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser", pages xiii, xiv, xv.

- DEPARTMENT OF PUBLIC HEALTH: Medical Officer.
 DISTRICT HOSPITAL, KALGOORLIE, WESTERN AUSTRALIA: Resident Medical Officer.
 LAUNCESTON PUBLIC HOSPITAL, LAUNCESTON, TASMANIA: Resident Medical Officer.
 PERTH HOSPITAL, PERTH, WESTERN AUSTRALIA: Resident Medical Officers.
 ST. GEORGE DISTRICT HOSPITAL, KOGARAH, NEW SOUTH WALES: Honorary Obstetrician.
 ST. MARGARET'S HOSPITAL FOR WOMEN, SYDNEY, NEW SOUTH WALES: Resident Medical Officer.
 THE BUNDARRA DISTRICT HOSPITAL, BUNDARRA, NEW SOUTH WALES: Medical Officer.
 WESTERN SUBURBS HOSPITAL, SYDNEY, NEW SOUTH WALES: Honorary Officers, Resident Medical Officers.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associate Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL, are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor", THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

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SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and book-sellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad per annum payable in advance.